

## KR Unexamined Patent Publication(A)

### Bibliographic Data

In. C.	G06F 17/60
Application No.	KR1998-028642.
Application Date	1998-07-15
Unexamined Publication No.	KR1999-013893.
Unexamined Publication Date	1999-02-25
Priority Claims	97-207321 1997-07-15 Japanese (JP)   97-207322 1997-07-15 Japanese (JP)   97-207323 1997-07-15 Japanese (JP)   97-212581 1997-07-22 Japanese (JP)   97-212582 1997-07-22 Japanese (JP)
Agent	HA, Sang Ku   HA, Young Wook
Inventor	NGUYEN,JOHNH.   EMOTO,HIROSHI
Applicant	HuJiWaRe YoSiYaSu   KaBuSiKiGaI Sya TIEI Beul
Title of Invention	EQUIPMENT INSPECTION AND AN EVALUATION SYSTEM, WHICH IS USED FOR INSPECTING AND EVALUATING A STEAM TRAP BY DETECTING A VIBRATION LEVEL AND HOUSING SURFACE TEMPERATURE OF EACH TRAP, AND AN EQUIPMENT MANAGEMENT SYSTEM
Title of Invention(KPA)	EQUIPMENT INSPECTION AND AN EVALUATION SYSTEM, WHICH IS USED FOR INSPECTING AND EVALUATING A STEAM TRAP BY DETECTING A VIBRATION LEVEL AND HOUSING SURFACE TEMPERATURE OF EACH TRAP, AND AN EQUIPMENT MANAGEMENT SYSTEM

### Abstract(KPA)

**PURPOSE:** Provided are an equipment inspection and evaluation system which allows to effectively check and evaluate a device, like steam trap, and an equipment management system which allows to effectively manage the information on the individual device, like the steam trap, including the evaluation results of the equipment inspection and evaluation system.

**CONSTITUTION:** An equipment inspection and evaluation system for checking and evaluating an equipment including many devices comprises: a main memory, in which many inspection data processing sequences for processing the data obtained through the inspection of the each device; an auxiliary memory; a sequence storage controller, storing an inspection data processing sequence, selected from the main memory, in the auxiliary memory; a sequence calling member, selecting the corresponding inspection data processing sequence in the auxiliary memory; and inspection data processors(21,13), evaluating the checked device according to the corresponding inspection data processing sequence.

© KIRO 2007

### Abstract

The check on equipment automated test equipment is used when the surface temperature of the housing of the oscillating level of each trap and trap are detected, the steam trap is checked out and it evaluates. The oscillating level and the detected temperature are used when the steam determines whether it leaks through the trap or not; whether and, the steam leak range is about a or not. The apparatus for management of equipment is connected to the check on equipment automated test equipment by data transmission cable. Inspection data of the trap is received from the checked out evaluation system. Inspection data which are received in order to calculate the number of traps which the management system is insufficient are analyzed. The rate of insufficient trap electrified body traps that is the loss is caused by the steam leak etc.

### Representative drawing

Fig. 1

### Description

#### ■ Brief explanation of the drawing

Figure 1 is a check on equipment, the evaluation and schematic block diagram of the management system according to the first preferred embodiment of the present invention.

Fig. 2 indicates the configuration of the memory of the check on equipment evaluation system indicated in fig. 1.

Fig. 9 indicates the save configuration of the trap data memory area indicated in fig. 2.

The concept formation of the present domain displayed on fig. 4 is fig. 2 is indicated.

Figure 5 is a front view of the checked out automated test equipment of the checked out evaluation system indicated in fig. 1.

Figure 6 shows the operation of CPU which is set from the memory displayed on fig. 2, and calls trap data in the preset domain, and calls trap data from the preset domain.

Figure 7 shows the form of the display which is given in the display part of the checked out evaluation system displayed on fig. 5 trap data of the trap desiring in the preset domain is set up.

Figure 8 shows fig. 7 and the other process of having in order to set up the display of different style and trap data.

Figure 9 shows the form of the display which is given in the display part of the checked out evaluation system displayed on fig. 5 desired trap data stored in the preset domain is called.

Figure 10 is a schematic diagram of the steam piping system including the bypass pipe (bypass pipe).

Figure 11 is a state transition diagram which schematically shows the operation of CPU of the checked out evaluation system which checks out the trap and valves and evaluated.

Figure 12 shows the frame type of data transmitted from the checked out evaluation system to the management system.

Figure 13 shows one part of data stored in the memory unit of the management system shown in fig. 1.

Figure 14 shows the example of the display which is given when setting up references which use in the management system to evaluate the trap with checked out.

Figure 15 shows the example of the evaluation result table of the trap made in the management system.

Figure 16 is a state transition diagram for schematically illustrating the CPU operation of the management system for analyzing data of the trap according to set references trap checked out reference to evaluations are set.

Figure 17(a), and 17 (b) show the example of the display which respects to additionally set up the special management item by the management system. Figure 17(a) shows the list of data coming in into each management item. 17 (b) indicates the display which is displayed when data are updated.

Figure 18 is one part of example of data managed under the management system.

Figure 19 is a state transition diagram which schematically illustrates the CPU operation of the management system setting the special management item in additionally.

Figure 20 is a state transition diagram which schematically illustrates the CPU operation of the checked out evaluation system setting the special management item in additionally.

Figure 21 is an example of the display shown in on display of the management system which is the icon for each trap in the displayed piping system with the steam facility piping system.

Figure 22 is an example of detail data of the specific trap which from the things furnace displayed on the display screen displayed on fig. 21 is selected.

Fig. 23 illustrates the arrangement of the display indicated in fig. 21.

It illustrates whether the display displayed on fig. 24 is fig. 21 is how formed or not.

Figure 25 shows the result of the processing displayed on fig. 24.

Figure 26 is a state transition diagram which schematically shows the CPU operation of the management system for performing the function indicated in fig. 25 in fig. 21.

Figure 27 is example of the display which respects to set conditions in order to evaluate traps searched in the management system.

Figure 28 is a display which indicates to meet the set condition displayed on result is fig. 27 of searched traps.

Fig. 29 illustrates whether searched data are how rearranged or not.

Figure 30 shows the thing which searches data after being rearranged.

Figure 31 is flowchart for illustrating the CPU operation of the management system the function displayed on fig. 30 in fig. 27 is performed.

Figure 32(A) and 32 (B) are the flowchart which more concretely, illustrates data revival step of fig. 31.

Figure 33 is flowchart for illustrating the CPU operation of the checked out evaluation system controlled from the management system according to the determined checked out valuation order.

#### ■Background Art

The present invention is connected to the steam trap which with being connected to the check on equipment evaluation system for the checked out evaluation configuring device of facility forms for example, the part of the piping system of the steam application facility.

The present invention is moreover connected to the installation management system for managing one facilities based on many information including the evaluation of the facility made with the check on equipment evaluation system. And it is connected to the facility management using especially, computer.

#### ■Technical Task

One steam trap is the auto valve which it drains condensate from the steam lines of the steam application facility of one facility and automatically while not allowing the steam deviated from from lines or it moves. One does not operate although it is one of this steam trap. If it is the case, for example, the steam is leaked out through the steam trap or when valve does not act, it can be reduced by the efficiency of the facility and the total installment can cause trouble in any kind of case. Therefore, it is important to periodically check out each steam trap in order to maintain the steam application facility and evaluate.

Generally, the steam application facility includes many steam traps of number. Their evaluation need the office time to be many and it very much requires the cost as a result. Moreover, it respects to do and the evaluation and maintenance of the steam trap have to be ascertained. The information on facility is managed including the evaluation result of each steam trap to the central product and the operating state of each steam trap can be determined as the part of the total installment.

Therefore, the object of the present invention provides the check on equipment evaluation system which effectively can check out the individual apparatus for forming the parts of facility and can evaluate. It has for example, the steam trap of the steam application facility.

It has the purpose of anothering of the present invention to provide the installation management system certain and which effectively can manage for example, the information about the individual apparatus like the steam trap including the result of the evaluation of being performed with the check on equipment evaluation system.

The purpose of anothering provides the recording medium having the facility management program stored as the use realizing the computerized installation management system.

#### ■Structure & Operation of the Invention

With becoming concrete in the checked out evaluation administration system for the steam trap the present invention is explained. It fig. 33 to reference and it illustrates in fig. 1.

Figure 1 is a block diagram of the checked out evaluation system (1) and the management system (2) connected by data transmission cable. Two systems are connected to the time when data are only moved between them by the cable (3). Therefore, for example, it is used when the checked out evaluation system (1) evaluates the steam trap or the other apparatuses the checked out. The management system (2) is used in other words in order to process data about each steam trap. And those are separated by removing the cable (3).

When the steam leaks through the trap (it does not show), relatively it is frequent. The successive supersonic vibration is generated in the inside of trap. The size of vibration that is, the oscillating level (L) and surface temperature (T) of the trap are connected to the steam leakage. It is not checked out evaluation system (1) based on the cross relation whether the steam leaks through the specific trap, whether it determines from the oscillating level (L) and the measured temperature (T) whether and, the extent of the steam leak is the how much. The checked out evaluation system (1) for this purpose provides the probe (probe) (11), and the checked out automated test equipment (12). The probe (11) detects the oscillating level (L) and surface temperature (T) of the specific trap. It is not checked out automated test equipment (12) whether the steam leaks through the trap, whether in order to determine if the steam leaks whether it what is the extent of the steam leak, or not measurement signals are accepted from the probe (11) and it processes.

The probe (11) has the vibration sensor (not illustrated) for sensing the level (L) and the temperature sensor (not illustrated) for detecting the temperature (T) of the trap. Vibration and temperature sensor are located after the tip in the probe (11). When it is pressed about the surface of the trap in which the probe (11) is inspected, the sensor senses the oscillating level (L) and temperature (T) from the surface of the trap. The sensed vibration, the vibration sign signal and the temperature display signal corresponding to temperature are outputted. The signals are connected to the checked out automated test equipment (12) including the CPU (13) by the dedicated cable (11a).

Vibration and temperature display signal are amplified in the amplifier (14). Vibration and temperature display signal are transformed to the digital signal in the analog to digital converter (A/D) (15). Provided is the trap check result kind indication data (it is done by trap inspection data from next) of the specific trap in the output of the A/D converter (15). Trap inspection data is applied to the CPU (13). As the CPU (13) stores the correlation data (D) in the memory (16) of being provided by RAM or ROM, the information indicating the oscillating level (L) and surface temperature (T) of the trap included in trap point gum data is processed. The correlation data (D) indicates correlation with the steam leakage through the trap oscillating level and surface temperature and trap. The trap point gum data (D) is processed. The CPU (13) determines whether whether the steam leaked from the trap or not is not. If the steam leaks, it determines whether it what is the range of the steam leak. The decision result is indicated on the display unit (17) which is the LCD indicator for example. It is stored in the memory (16).

When the checked out of the desired trap everyone was completed, the checked out evaluation system (1) is connected to the management system (2) with the cable (3). Command is given through the operating unit (18) which includes the plurality of push-buttons or the keys in order to transmit the decision result in the management system (2) in the CPU (13). The decision result is transmitted with the I/O interface and cable (3) in the management system (2). The detailed description about data processing at the management system describes later.

The correlation of the steam leakage about the oscillating level (L) of the trap and surface temperature (T) are depended on the configuration of the inspected trap. It can be classified as the trap based on their operation as for example, the disc type trap, the bucket type trap, the automatic temperature control (THERMO) trap, float type, the temperature control type trap etc. In the meantime, if it is manufactured by the them other manufacturer when being the trap of the same type-in two, the other correlation can exist. Therefore, the checked out evaluation of the trap has to be for type or the structure of the inspected specific traps based on the correlation (correlation data (D)) in order to make the checked out evaluation of the trap straight based on this correlation.

The checked out evaluation system (1) for this purpose provides the memory (16), and a plurality of correlated datas (D) for mostly commercially available all traps. Therefore, the trap type can not be taken into consideration of and the checked out can be evaluated. Only when the trap is only commercially available, the checked out evaluation of being exact can be performed.

The memory (16) provides as indicated in fig. 2, the trap data memory area (161). Available correlation data (D) are stored in this memory area (161). The memory area (161) stores trap data, including the type of each trap the company code, expressing the maker of each trap the principles of operation of the trap etc. besides each correlation data (D).

It is digitally designated for each trap of oneself intrinsically which is the quadruplicity inferred as the trap code for example. As indicated in each trap data including the correlation data (D) in the trap data memory area (161) is fig. 3, it is arranged based on their trap codes in the trap code.

As to each of type, it has the trap model more than 2,000 kinds. The trap data memory area (161) stores trap data of the trap more than 2,000, and the correlation data (D). In order that one trap is evaluated the checked out, it is necessary to have to seek out one correlation data (D) at the correlation data (D) more than 2,000 stored in the memory area (161). It is not like that easy to determine only data one desiring in many data.

According to the present invention, it indicates in fig. 2, as if the domain inferred to the preset (Preset) domain (162) is included the memory (16). The domain is separated from the trap data memory area (161). In the preset domain (162), it is stored in advance or it is preset to such traps evaluated by desired one data, that is, the checked out evaluation system in traps with checked out. Trap for data stored in the preset domain (162) can be the trap in the steam device which for example, the checked out is evaluated.

In the practical checked out evaluation process, trap data including the correlation data (D) of the specific trap is called from data stored in the preset domain (162). In this arrangement, range can become more narrow from \*\*\* searching for desired data.

The to call trap data desiring from the preset domain (162) or read thing and the thing are performed by the CPU (13) according to the key input through data input part (18) writes trap data by the preset domain (162). The CPU (13) moreover indicates the message based on the key input on the display unit (17).

As the CPU (13) operates, the regulation program is stored in the regulation program domain (163) which is in the memory (16). In order that this embodiment is illustrated, it has the regulation program domain (163) in the ROM configuration. The trap data memory area (161) and preset domain (162) are one of the RAM configuration.

Figure 4 is a concept display of structure of the preset domain (162). The preset domain (162) provides the six trap types (the disc type, the bucket type, the automatic temperature control type, the float type, the temperature control type, the besides type) a plurality of, and that is, the six divided memory sub-regions (162a) is included. Each of the sub-region (162a) provides the smaller memory sub-region (162b) of a plurality of (for example, 30). Trap data for one trap model is stored in the smaller memory district (162b). Therefore, in the example indicated in fig. 4, the trap data (30) of the trap model 30 of each type can be stored in each sub-region (162b).

As described above, the command and the command respecting trap data desiring from the preset domain (162) with reading are given through data input part (18) respects desired trap data in the preset domain (162) with write. As shown in Figure 5 the key above data selection key group (183), number key group (184). The display unit (17) is arranged in the Cupolar part having on such key group. It can be the LCD display panel of the cephalic slit indicating message. The checked out automated test equipment (12) generally to the size which can be the right angle and be unable to bring. The checked out automated test equipment (12) is in the man top end surface with the input terminal equipment (12a) in order to connect the apparatus (12) to the probe (11) with the cable (11a).

Next, desired trap data is respected in the paper and the preset domain (162) which how manipulates the keys on data input part (18) with write what is explained and the CPU (13) how operates, whether it does with reference to figs. 6 and 7 whether the trap code is

how used and or not it illustrates.

Figure 6 is a state transition diagram for illustrating the operation of the CPU (13) It is read from the preset domain (162) trap data is used in the preset domain (162). Fig. 7 illustrates sequences manipulating the keys on data input part (18) trap data as the preset domain (162) for write. It illustrates to indicate message on the display unit (17).

Firstly, the ON key which is in the power switch group (181) is pressed down. As indicated in the CPU (13) for the work of the ON key is fig. 6, the CPU (13) checks about 3 boy woodcutter inside oneself to the point of view of the predetermined function. Oneself is positioned to the free mode (idling mode, M2). In as indicated in Figure 7(a) the CPU (13) waits for command from data input part (16) in the free mode (M2), the display unit (17) is the heat, the Seazary number and five column number are indicated. MODEL is indicated in the lower part heat. The front enthusiasm Seazary number which is in the display unit (17) is the area code showing the steam handling facility in which the specific trap is positioned. The back enthusiasm five digit is the trap number which is given in each trap which the checked out is evaluated. Two numbers are arbitrarily designated by the man managing the trap. However, because of not participating in to read trap data on two-step from the preset domain (162) and write trap data as inside, it does not give the description of any more about them.

Next, by pressing the proper key the trap type is selected in the trap type selection key group (183). And then, as indicated in two digit places after the indication of MODEL of the lower part heat and trap type is Figure 7(b) the display unit (17) is indicated the CPU (13) comes into the model write mode (M4), it is selected through the trap type selection key (183). Figure 7(b) indicates that the FLOAT key in the trap type key group (183) pushes. If the trap type tries to be changed from the FLOAT type into the other type, the desired key for type pushes.

The double figure which is in the lower part heat displayed on Figure 7(b) \*\*\* of 30 having for the selected type of the preset domain (162) in the submemory domain (162a) is one number among the memory area (162b). Number the smaller memory area (162b) is graded from 00 to 30.

It is pressed in order to input one of the number of 30 from the indicated arrow ↑ and 00 which desired \*\*\* corresponds to ↓ key to the memory area to their surfaces in the functional key group (182). That is, one of small memory area (162b) for desired trap data being storeds are selected by the operation of ↓ key and arrow ↑. For example, in order to select the firstly smaller memory area which number is graded to 1 which can be inferred as the memory number, the arrow ↑ is pressed down. In this case, as indicated in Figure 7(c), message is indicated. In the memory number lower part (in other words, the first number of the memory number) on the display unit (17), in order to indicate that number is changed, the cursor (17a) flickers. The memory number 0 does not indicate the smaller memory area (162b). The CPU (13) has to gaze steadily to be increased to show the kind of the message which indicates to have in the model write number (M4). Consequently, \*\*\* old trap data cannot be used in the memory number 0.

After the memory number is selected, the numeric key is used in order to input the trap code of used trap data. It is the unit number young to the digit starting with the digit which is in the most high location and is greatbeneath have to for example, for example, the churn column number, the white column number, the decimal digit number etc. with the share L. When the churn column number was input, the CPU (13) enters the trap code input mode (M6). As it indicates in the churn column number, for example, Figure 7(d), message on the display unit (17) indicates the time when 1 comes in. The cursor (17a) moves in location under the churn column number.

The CPU (13) returns to the model write mode (M4) in the time when you column number forming the trap code altogether comes in sight the trap code input mode (M6).

The trap code for the specific trap can know from the table including the trap code seen in the relation corresponding to the trap model.

After the trap code is input, the CPU (13) checks the trap code inputted with trap data stored in the trap data memory area. It seeks out whether trap data is not whether trap data for each trap code exists in the trap data memory area (161). Trap data exists. If it is the case, the CPU (13) checks whether it is the trap type (the input state displayed on Figure 7(b)) in which the trap corresponding to the inputted trap code is inputted to initial or not whether that is, the trap is the float type trap. It is one in which the trap type is exact. If it is the case, the CPU (13) comes under the inputted trap code in which the trap model is indicated on the display unit (17). Figure 7(e) shows that the trap model J3X-2 corresponding to the inputted trap code 1000 is indicated on the display unit (17).

And then, when it consisted of the state where the CPU (13) was indicated as Figure 7(e) and the ENT key which was in the number key group (184) pushed, CPU reads trap data corresponding to the inputted trap from the trap data memory area (161). That is, in the example which trap data for the trap of model is explained, it is J3X-2. Read trap data is used in the first memory area (162b). And then, message on the display unit (17) changes into the message which indicates that it is completed to record trap data. The message displayed on Figure 7(f) is that. The CPU (13) operates again to the free mode (M2).

Alternativley, when the state displayed on the apparatus is Figure 7(e) is, by pressing ↓ key trap data is recorded, in this case, it operates again to the state displayed on message on the display unit (17) is Figure 7(c) the arrow key is pressed.

Moreover, by pressing the proper numeric key the trap code for the trap which desires in order to change recorded trap data which is in the state displayed on If, Figure 7(e) is inputted. It is put back in the state displayed on the proper numeric key is Figure 7(d) in the apparatus (12).

In the state displayed on Figure 7(d), it returns to state displayed on the CPU (13) is Figure 7(c) and Figure 7(g) it finds any trap data corresponding to code in the inputted trap in the trap data memory area (161). In this case, the exact trap code is input.

In Figure 7(g) the state, the renewal of the thing which records trap data as the first trap memory area (162b) If the ENT key is pressed



down or trap data having in the first trap memory area (162b) does not perform for example.

Referring to Figure 7, by pressing the key on keyboard, the trap code is so far directly inputted to the trap desiring according to the explained data recording method. But if the trap code is not known to the desired trap, only when finding that from the previously explained trap code list, it plays the in other words. According to the explained example, the trap model search and input mode are moreover used besides the trap code input method. It is recorded based on the trap model which trap data for the trap in which the trap model is searched in the trap model search and input mode in the desired trap and desiring is searched. It does with reference to figs. 6 and 8 and the trap model search and input mode are explained in detail.

In the state explained from Figure 8(a) to (c) is Figure 7(a), it is similar to the state explained to (c). It consists of the CPU (13) model write mode (M4) when the message displayed on Figure 8(c) is indicated. As indicated in the CPU (13) is fig. 6 \*\*\* key pushed in the bimodal (M4), it enters the manufacturer selection mode (M8). In the explained search assessment apparatus (12), when doing not have any key called as the search key, but the key called as the information is used in the functional key group (182) as the search key. One displayed on message on the display unit (17) is Figure 8(d) at the same time, the search key or the information key was pressed down is diversified. Particularly, the word company code provides one order of magnitude corresponding to the name of company displayed on the lower row it is indicated on the heat. In the explained example, it is indicated to come under the company code 0 and name of company ABC.

The manufacturer selection mode (M8) is the mode for making a choice for the manufacturer of trap data of the recorded trap. Manufacturer is picked by pressing ↑ key and ↓ key public opinion one. It becomes with the change (it is increased or it reduces) and number or the company code having under ↑ key and the cursor (17a) which flickers when ↓ key public opinion one was pressed down is moreover changed with name of company.

CPU enters the model selection mode (M10) after manufacturer is picked in the manufacturer selection mode (M8). The desired Promega Corporation of the trap which the model selection mode (M10) is manufactured by the selected manufacturer. Particularly, the ENT key is pressed down when being indicated on Figure 8(d). And the CPU (13) enters the mode (M10). As indicated in this, the display unit Figure 8(e), it causes to be indicated. The trap (for example, the float type trap) displayed on Figure 8(e) is the model J3X-2 manufactured by the ABC company.

Operator previously differently makes it possible for the trap model search and input mode with the explained trap code input method to record trap data for the trap in which that desires although it does not know about the trap code. Therefore, the trap code list is no need to be used that.

Next, it does with reference to figs. 5 and 9 and it illustrates whether trap data is how read in the smaller memory area (162b) of the preset domain (162) of the memory (16) or not.

As you can see, in Figure 9(a), it is identical to (c) in Figure 7(a) to (c) of the thing explained in Figure 8(a) to (c) in other words. In Figure 9(c) is Figure 7(c) and Figure 8(c), the message J3X-2 is indicated on the lower part heat part of the display unit (17) followed the message model 01. The trap as to this, as to \*\*\*, which therefore has the memory number 1 trap data for the model J3X-2 is already recorded in the memory area (162b). Previously, it consists of the state displayed on the display unit (17) is Figure 9(c) it is explained and it has the CPU (13) in the model write mode (M4). But when the CPU (13) is the mode (M4), so that it reads trap data for the desired trap or trap data call, moreover, CPU consists of the model read mode (M12).

As indicated in Figure 9(c), in the model read mode (12) displayed on that is, fig. 8, after one is selected by the result of that the smaller memory area (162b) in which trap data for the desired trap is stored presses one among the arrow key, the ENT key is pressed down. The smaller memory area (162b) which is selected in Figure 9(c) than is the first memory area attached to the place where trap data for model J3X-2 the trap is included to 1 with number. As indicated in Figure 9(d) when the ENT key pushed, trap data is stored in the called, selected and smaller memory area, the trap model of called trap data is indicated on the display unit (17). In Figure 9(d), it is called to trap data for model J3X-2 the trap. The trap type and the trap model which is inspected because of being indicated on the plate in which them sticks to the trap housing just can be known as operator.

When trap data was called, the CPU (13) operates again to the free mode (M2). And then, according to trap data which model J3X-2 entrap is called, the checked out is evaluated. Thus, the checked out evaluation of being exact is finished.

As been above mentioned, in order to be immediately inspected, according to the present invention, trap data for the number of the traps can be only selectively stored in the preset domain (162). Trap data which the type of the trap is selected to be the first when it examines the specific trap and desires is selected from selected trap data for the trap type. Therefore, it becomes more easy to call trap data which desires than it calls that from trap data for all models of all types.

In the explained example, it is maximum number of trap data stored in the preset domain for each trap type 30. 30 valves are used for the following reason. Generally, in one steam application facility is 10 abouts for each trap type, the trap model most of 20 is used. Therefore, the smaller number of the memory area of 30 for each trap type is not restricted to 30.

In the above-described example, the preset domain (162) in which trap data is stored is classified into a plurality of small regions (162a) for each trap type. The preset domain (162) is classified into the other major element including the manufacturer element etc. for example.

Moreover, trap data is recorded in the preset domain (162) or it is above mentioned as the mode for calling from the preset domain (162), the mode is not restricted. For example, the primary phyla self-satisfaction of the model name of the desired trap which is used so that it search the model of the trap and the model look for the trap model is arranged (that is, front matching investigation). By using this trap model, trap data is recorded or it is called.

The steam piping system provides one or more element in groups which includes the main pipe (4) and by-pass (bypass) pipe (5) as been indicated on fig. 10. For example, when the trap (41) arranged in the main pipe broke down, the steam is leaked and that is mended or it has to be replaced. In this case, so that the opposite side bypass the trap (41) so that the steam flow be maintained in the opposite side of the trap (41) between point-to-point, the bypass pipe (5) is used. The bypass valve (51) for controlling the flow of the steam through the bypass pipe (5) is included. Valves (42, 43) are positioned at the opposite side of the trap (41) in order to control the flow of the steam through the trap (41).

If the trap (41) normally operates, as it is opened with the bypass valve (51) closed down and it is indicated by -- line (4a) through the valve (41), valves (42, 43) can control the flow through the trap (41). When the trap (41) is the malfunction, the valve (42, 43) is closed down and the bypass valve (51) is opened. And then, the steam can return through the bypass pipe (5) as it is expressed in the arrow (5a). Repair and substitution can be performed in this case, and \*\*\* in which the flow of the steam is maintained at least although it does not do and the drainage of condensate stops the operation of facility with the trap (41) in the trap.

But the bypass valve (51) is destroyed and the steam leaks from that. If it is the case, the action efficiency of facility irrespective reduces about whether the trap (41) operates or not being not. Therefore, it is necessary to have to check out not only thing but also the bypass valve (51) checking out the trap (41) which was in the main pipe inside.

The check on equipment automated test equipment (1) moreover has the valve checked out assessment function. The steam leak through the valve (51) is known to generate the supersonic vibration as this case of the trap in the bypass valve (51). Therefore, it is possible that it determines to measure the oscillating level in the valve (51) whether whether the steam leaks through the valve (51) or not is not or not.

The vibration in the valve (51) is sensed by adversely pressing the vibration sensor in the surface of the valve housing in the end of the probe (11). The size or the level of vibration is induced from data which are obtained by sensing vibration. System provides the valve checked out evaluating program memory area (164) in the memory (16) of storing the valve checked out evaluating program. According to this program, it is indicated on the display unit (17) and the oscillating level is provisionally stored in moreover, the memory (16). In order to whether it is not whether the bypass valve (51) is the malfunction or not or not evaluate (whether the steam leaks or not is not good for example), the valve checked out evaluating program is performed in the CPU (13).

The temperature at the vibration of the valve (51) and surface are detected when the end of the probe (11) is adversely pressed by the surface of the valve (51). The valve checked out evaluating program processes temperature data from the probe (11) in order to obtain the temperature of the valve (51). It is indicated on the display unit (17) and the temperature is stored in the memory (16) with the oscillating level. Therefore, operator can know whether it is not whether the bypass valve (51) is the malfunction or not and or not moreover, the surface temperature of the valve (51) just can be known as operator.

It is necessary to have the trap point gum evaluating program depending on on the apparatus for the checked out being evaluated when the check on equipment evaluation system of the present invention is used and the to select one out of the valve checked out evaluating program thing. If the trap (41) is evaluated, the trap point gum evaluating program is performed and if the valve (51) is evaluated, the valve checked out evaluating program is selected. The checked out evaluation system according to the embodiment explained for this purpose is arranged so that the checked out evaluating program be switched through data input part (18).

The system according to the explained embodiment of the present invention can be operated in the manual \*\*\* in the automatic switching mode. In the automatic switch mode, the trap point gum evaluating program and valve checked out evaluating program are automatically switched in the predetermined number mode. For example, the same number of the valve (51) and trap (41) can be estimated on the whole. The selection of the program is performed through data input part (18).

Now, it does with reference to fig. 11 and the operation of the CPU (13) of the checked out evaluation system task according to the embodiment which is explained in order to evaluate the trap (41) and bypass valve (51) the checked out is explained. Figure 11 is a state transition diagram which conceptually illustrates operation of CPU. The mode explained in the state transition diagram corresponding to the program of fig. 11 is operated in CPU. In fig. 11, the trap point gum evaluation mode (M20) is the mode processing vibration sign data in which the CPU (13) is provided by the probe (11) according to the trap point gum evaluating program and inspection data including temperature display data. That is, the checked out the correlation data (D) for the trap (41) is estimated. In the valve checked out evaluation mode (30), the CPU (13) processes inspection data according to the valve checked out evaluating program.

By pressing the ON key having in the power switch key group (181) the checked out automated test equipment (12) is provided with the power and it checks oneself according to process of being predetermined and the CPU (13) enters to the thereafter free state (100).

Here, it is the free state (M2) and the same meaning on the whole in the state transition diagram displayed on the state (100) which is at leisure with term used in fig. 6. In the free state (100), it waits for command and the CPU (13) prepares for the checked out evaluation of the trap (41) or the valve (51). After the apparatus (12) is turned on, it becomes the free state (100). It is in the trap point gum evaluation mode (M20) and the CPU (13) prepares the checked out evaluation for the trap (41) against. Moreover, it is turned on of the apparatus (12), immediately the CPU (13) alwayses position in the manual switching mode in after. Moreover, in the free state (100), the CPU (13) indicates the message which shows to be the thing, having in the state (100) in which the CPU (13) is free at the display unit (17) the trap point gum evaluation mode (M20), and the manual switching mode.

It assumes immediately that the CPU (13) evaluates the trap (41) after the checked out automated test equipment (12) is turned on. It pushes in the surface of the trap housing so that the probe (11) be evaluated. The measurement starting the switch on the probe (11) is turned on and the probe (11) starts to measure the level of the supersonic vibration of the trap (41) and surface temperature. Simultaneously, the CPU (13) enters the evaluation phase (200).

In the evaluation phase (200), the CPU (13) indicates the message showing the supersonic vibration level and surface temperature of

the trap (41) in which the display unit (17) is measured. In accurately measuring the physical amount of temperature and supersonic vibration in the trap (41), the time of little will be required. Therefore, for example, the probe (11) will suppress about 15 boy woodcutter inside trap (41).

The CPU (13) enters the decision step (300) after the measurement of temperature and vibration. In the decision step (300), inspection data is processed in the CPU (13). That is, data which relate according to the trap point gum evaluating program to the supersonic vibration and temperature of the trap (41) by using the correlation data (D). The range is automatically performed whether whether it has any steam leak with this processing or not does not have or not whether it what is the range of the steam leak or not. It is indicated on the display unit (17) and the determination of being performed is provisionally stored in the memory (16).

After the decision step (300) is completed, the CPU (13) prepares to revert to the free state (100) and evaluate the another trap (41) with checked out. The probe (11) is pressed down by the trap (41) for the checked out evaluation of the another trap (41).

First of all, the key on data input part (18), for example, the ENT key in the number key group (184) is once pressed down if the bypass valve (51) is evaluated instead of the trap (41). It moves the CPU (13) to the valve checked out evaluation mode (M30) from the trap point gum evaluation mode (M20) and this prepares for the checked out evaluation of the trap (51). Simultaneously, in the display unit (17) is the trap point gum evaluation mode (M20), the message which shows to change mode into the valve checked out evaluation mode (M30) in that is indicated.

Similarly in order to evaluate the bypass valve (51) the checked out in the checked out evaluation of the trap (41), the probe (11) is pressed by the evaluated valve (51). This automatically starts the checked out evaluation of the valve (51). Particularly, in order to produce vibration data and temperature data from the thing measured in the evaluation phase (200) and determine the oscillating level and surface temperature of the bypass valve (51) in the decision step (300), the CPU (13) processes vibration and temperature data according to the valve checked out evaluating program. The oscillating level and temperature are indicated and the oscillating level and temperature are stored in the memory (16).

It reverts to the automatically free state (100) and the CPU (13) prepares for the next valve checked out evaluation after the decision step (300). Therefore, if the checked out the if another bypass valve (51) is estimated, the probe (11) is pressed by the valve surface and the equal process is repeated. In the meantime, if it desires that operator evaluates the trap (41) with checked out, the ENT key is once pressed that and the CPU (13) is moved from the valve checked out evaluation mode (M30) to the trap point gum evaluation mode (M20).

As described above, in the manual switching mode, by pressing the ENT key when being in the state (100) in which the CPU (13) is at leisure in the checked out evaluation mode, the CPU (13) can switch the trap point gum evaluation mode (M20) and valve checked out evaluation mode (M30) interval. That is, in the manual switching mode, if the ENT key is not pressed down when being in the state (100) in which the CPU (13) is at leisure, it each other is not switched to the checked out evaluation mode being used currently. It is useful to successfully evaluate one of this property is the trap (41) and valve (51) twice the checked out.

But in order to by turns evaluate the synthesis of the bypass valve (51) and trap (41), by many times pressing the ENT key the checked out evaluation mode by turns switches moreover, the trap point gum evaluation mode (M20) and valve checked out evaluation mode (M30) interval and this is very complicated operation. Therefore, in order to by turns evaluate the trap (41) and bypass valve (51) the checked out, the automatic switching mode which is previously describe according operates the CPU (13) but it is used. According to the explained embodiment, by pressing the FUNC key which did not gouge with the functional key group (182) was followed by pressing 5 key, the to switch the automatic switching mode interval manual switching mode and the thing are performed.

When being set up that the CPU (13) operates in the manual switching mode, it can be transformed to the automatic switching mode which is the time consecutively pressed down by the designated order in the FUNC key and the state (100) in which 5 key is at leisure. The message which indicates that the switching mode of the CPU (13) is transformed to the automatic switching mode is indicated on the display unit (17).

Moreover, in the automatic switching mode in the CPU (13), if the ENT key is pressed down when being in the state (100) in which the CPU (13) is at leisure, the checked out evaluation mode can switch the trap point gum evaluation mode (M20) and valve checked out evaluation mode (M30) interval.

It assumes that the CPU (13) is the automatic switching mode and the checked out evaluation mode in which the CPU (13) is the trap point gum evaluation mode (M20) is assumed. Moreover, it assumes firstly that the trap (41) is evaluated. Firstly, the probe (11) is pressed by the housing surface of the trap (41). And the CPU (13) processes to the evaluation phase (200) and decision step (300) of the trap point gum evaluation mode (M20) in order to evaluate the trap (41) with checked out. When the decision step (300) was finished, it is moved to the valve checked out evaluation mode (M30) and the CPU (13) returns to the free state (100).

And then, the CPU (13) prepares to evaluate the bypass valve (51) the checked out. The probe (11) is pressed by the surface of the housing of the inspected valve (51) and the CPU (13) processes to the evaluation phase (200) and decision step (300) of the valve checked out evaluation mode (M30) for evaluating the valve (51) checked out. After performing the decision step (300), it is moved to the trap point gum evaluation mode (M20) and the CPU (13) returns to the free state (100).

Therefore, in the automatic switching mode, after the checked out evaluation is performed in the other mode, the CPU (13) automatically moves one among the trap point gum evaluation mode (M20) and valve checked out evaluation mode (M30). Therefore, when the automatic switching mode by turns evaluates the trap and bypass valve pair the checked out but the trap are used, the switching mode passively is no need to be switched as by turns. When being in the state (100) in which necessary to successfully evaluate two traps (41) or two valves (51) in the automatic switching mode and the CPU (13) is at leisure like the above-described thing, the ENT key is pressed down. And that can switch the checked out evaluation mode from the mode of rest.

In the example explained in the upper part, it is switched from every hour when one trap (41) or the valve (51) is evaluated to the



checked out evaluation mode. For example, two or more traps (41) or the valve (51) can be evaluated in each time and the valve (51) in other words be switched to the trap point gum evaluation mode (M20) from the valve checked out evaluation mode (M30). The number of the apparatus evaluated in each time can be changed.

In the example explained in the upper part, it is only evaluated only the bypass valve (51) according to the checked out evaluating program. But valves (42, 43) having in the main pipe (4) are evaluated according to the same valve checked out evaluating program (M30).

In case of the evaluation result is the check on equipment evaluation system (1) the desired checked out evaluation of the apparatuses which are the same as that of the trap and valve is completed, it is moved to the management system (2) by connecting to the management system (2) with the RS-232C data transmission cable (3).

In order to transmit the evaluation result, command is given in the CPU (13) having in the evaluation inspection system (1) through data input part (18). The CPU (13) transmits the evaluation result in response to that with I / O part (19) and cable (2) in the management system.

It does with reference to fig. 12 and generally data transmitted to the management system (2) are illustrated in the checked out evaluation system (1).

In fig. 12, the determination code shows the decision result data display. It is encoded from the evaluation result to double-byte decimal number data. Data moved to the evaluation result display \*\*\* provides the checked out data of the area code, the trap number, the trap model, the trap type, the trap, the steam pressure, which is busy the priority, the management data (the user origin code) etc.

The data displayed on fig. 12 is data of one trap. Therefore, data of 10 the trap is successfully moved from one frame type if the trap of 10 is evaluated with checked out.

In fig. 12, it is known as the adjustment code for being used for the digital data communications protocol and the code STX, check sum, ETB, CR checks the transmission start, and the sum total. The end of transmission carriage return is indicated.

Example of evaluation results provided by the checked out evaluation system (1) is same as those of the lower part.

It determines whether the steam leaks and or not then the CPU (13) of the checked out evaluation system (1) or that once determines the range of leak. The display of the jet is indicated in the display unit (17) for the trap (the trap in which the expressed sound appears) having the steam leak of the bulk. The extent of the steam leak the leak / bulk, and the display of the leak / in-between or the leak / small amount indicate the small amount steam leak in which the bulk steam leak, in which the steam leakage from the trap is many the in-between steam leak in which the steam leakage is in-between from the trap, and the steam leakage from the trap are less in the jet than the linked data. If the traps nearly does not act state is determined because of being in the state that, the display of closed is given in the display unit (17). If the drainage of condensate is imperfect, condensate stays at the inside of trap and the temperature of the trap is reduced and it detects that and the checked out evaluation system (1) provides the low message of temperature for the display unit (17). Moreover, if and, the temperature is preset in the temperature range outside if the trap which the checked out is evaluated is the temperature adjustment type, the system (1) detects that and the message of the failure of regulating is represented. If it is determined that it does not become wrong to be in the inside of trap, the display of the superiority is written.

As to the skilled operator, the steam leaks from their experience in where, whether the trap lid, and another part of gasket or little are positioned from the main body of the trap. According to the explained embodiment, the checked out evaluation system (1) is arranged so that the information related to the location in which the steam leaks in the evaluation texture redundant be passively input through data input part house (18). The steam shows the display of the leak / main body if it leaks through the trap main body. The steam leak indicates the message of the leak / gasket if it is due to the malfunction of gasket.

Yet, it replaces for the trap which was not inspected or does not operate in check results and the information flag can be passively inputted and it is not yet inspected, message is indicated in other words it is not good with service.

As indicated in fig. 1, the management system (2) is connected to the memory (24) of including the CPU (21), and for example, mouse and keyboard data input part (22) and the CPU (21), the display unit (23) (the cathode ray tube or the LCD display unit), and ROM and RAM, and I / O-circuit (25). In the point of view of the hardware, the management system (2) is provided by the personal computer for example.

The memory (24) stores detailed data of each traps. Detailed data provides application or the use of the area code, the trap number, the trap model name, manufacturer, the trap, in which for example, the specific trap shows in facility where it is located the steam pressure (the operated pressure), and the priority of each trap. Moreover, the memory (24) analyzes data which store the management program in order to provide the operation action and are transmitted from the checked out evaluation system (1) in order to manage each trap with facility. The management program provides the recording medium (not illustrated) which is the disc, the hard disk, the magnetic tape, CD-ROM, the magneto optical disk, DVD, the paper tape which is possible in the memory (24) with for example, compliant.

Data sent through the cable (1) from the checked out evaluation system (1) are applied to the CPU (21) through I / O-circuit (25). And that is stored in the memory (24). Data from the checked out evaluation system (1) is arranged in the list which is the same as that of the thing displayed on fig. 13 the CPU (21) arranges data of the trap already stored in the memory when storing data from the checked out evaluation system (1) in the memory (24). In the list, it is rearranged in each data based on the area code and trap number. In order to provide the operation action and calculate the loss etc. according to the management program, caused by the steam leak from the trap number, breaking down the failure ratio, and the trap breaking down the CPU (21) analyzes data stored in the memory (24). It is indicated on the display unit (23) and the analysis is outputted in the memory to the peripheral like printer and/or the storage. The

man operating facility from the analysis of data performed by the management system (2) can grasp the effectiveness of each trap having in the operation state and facility. That can foresee traps needing repair or substitution. Consequently the proper maintenance of the trap and facility can be performed. If the man operating facility is different, it determines that the trap is repaired or it is replaced. For example, the action efficiency is reduced in facility. So it does not give any adverse effect to the product manufactured with the facility of the purpose inside of trap which is used when the steam leaks through the trap during. Therefore, it determines whether the trap when amount of the steam leak is in-between or the small amount is the malfunction and or not with being repaired or replaced them is not determined any kind of man in other words. The standards which the apparatus determines as the malfunction, repair, or replace can be set up by the facility manager.

The standards setting can be realized by the management system (2) of the present invention. According to the CPU (21) of the management system (2) is the management program, it operates to the next mode.

The arithmetic operation is preferentially provided. Data are analyzed. The CPU (21) is indicated like the drawing in which the display unit (23) is indicated in fig. 14. By using the drawing, it selects each trap estimation item to meet as the order that them is determined as the malfunction and it determines operator. The thick arrow (23a) displayed on upside left-hand portion can be cursor and that can move the screen the upper part with mouse at its convenience.

The square (61) is indicated on the front of each estimation item like the jet, leak / bulk, leak / in-between, leak / small amount, and the closed and low temperature, failure of regulating, leak / main body, leak / gasket. If it is evaluated as one of this items in which traps are imperfect and which can be considered, the indicator house is adhered to the sequence (61) before the proper item. Moreover, the management system (2) operator is arranged in other words so that she oneself add judgement items. Operator is selected since the judgement items indicates square in the customer code display front.

In order that breaking the jet trap down the discrimination lock management system (2) is set up, it moves the cursor (23a) and it presses the left button of mouse, the square (61) of the display front of the jet is checked.

Figure 14 shows the establishment of determining whether the next trap is the malfunction or not: the trap (the failure of regulating trap), in which the thing (expressed traps), in which the steam is expressed from the trap the thing (the leak / bulk trap), which leaks many amount the steam is expressed from the trap the blocked trap (the closed trap), the thing (the low temperature trap) in which the temperature of the trap is so low, and the thing adjusting temperature are failed the thing (the leak / main body trap) in which the steam leaks through the trap main body, and the thing in which the steam leaks through gasket (the leak / gasket trap)

It can be classified as the trap (this harrow says to be the reserved trap like) which is not used with the trap (this harrow says to be the boiling point gum trap like) which is not yet inspected as the malfunction trap. Reserved trap items for the trap doing not use for the boiling point gum trap are yet expressed for this purpose before them in the square (62) it is not yet inspected. The boiling point gum trap or the reserved trap is determined as the malfunction if (of in other words, the reserved front (it is not yet inspected) square (62) is if check indicated.

It moves to the square displayed on the front of the item which in order that sets up cancel, the cursor (23a) desires. The left family button of mouse is clicked.

After the judgement items for determining the trap breaking down is checked, the cursor (23a) is moved in order to click OK which is in the right top of screen, and the button (63).

And then, the CPU (21) handles only traps checked with classification. It handles only traps classified as the normality which is not marked or the good trap.

According to the evaluation result displayed on fig. 13 is the standards displayed on fig. 13 the trap is normality thing is determined, in order to determine that the trap is the malfunction, it is analyzed. The trap which the decision result shows up in the list in the drawing 15, has the trap number 6 is evaluated as the failure of regulating. With being evaluated as the leak / bulk and being the malfunction it is determined as the trap having 7. But it is determined as the trap having 9 as the leak / in-between and leak / small amount with the respective evaluated trap number-3 as the superiority. In fig. 15, numbers which are in the loss (\$) heat indicate the dollar loss damaging due to the steam leak.

The button (64) classified as the default in the display unit indicated in fig. 14 is pressed down or it is clicked. If it is the case, the CPU (21) automatically sets up the insertion criterion. For example, as to the default, the CPU (21) adds the check mark to the leak, leak / bulk, leak / in-between, leak / small amount, and the front of the closed and low temperature, failure of regulating, leak / main body, leak / gasket to the square (61). And then, all traps deviated from from this classifications are handled as the malfunction trap.

When operator pressed the button (65) used as cancel or it clicked, the display of on the screen is canceled. The button (66) which was used to if be help was clicked. Help shows to include the description about the given display item.

The thing providing operation and arithmetic operation of the CPU (21) for setting up the decision criteria, and the analysis of data according to the standards show up in fig. 16.

Firstly the CPU (21) enters into the free state (101) to the first. And menu as to that, of the CPU (21) is indicated on the display unit (23). Operator can set up whether any kind of kind of the analysis and operation is used or not.

It provides for the display unit displayed on operator is fig. 14 the command through data input part (22). And then, the drawing displayed on fig. 14 the CPU (21) moves to the selection stage (102) is indicated on the display unit (23). The mouse in the selection stage (102) is used when by marking proper one among squares (61, 62), among the estimation item is chosen.

After desired estimation items are selected, after that is, the decision criteria is set up, CPU moves to the update stage (103). And the set up standards is stored that. And then, the CPU (21) returns to the free state (101).

In the free state, when operator enacted the command through data input part (22) in the CPU (21) in order to start the analysis of data and arithmetic operation, CPU moves to the analysis phase (104). In the analysis phase (104), the stored update stage (103) is performed and the trap plate shift is based on the standard of establishment. It is indicated as the form displayed on decision results for example the display unit (23) in fig. 15. Decision result is used when other desired data are calculated with the failure rate percent. In the analysis phase (104), after the analysis is completed, the CPU (21) returns to the free state (101).

The default button is pushed. When it has the CPU (21) in the selection stage (102), the CPU (21) moves to the insertion criterion configuration stage (105). The insertion criterion is previously explained and it is set up. Thereafter, the CPU (21) returns to the selection stage (102).

The cancel button (65) is pressed down when the CPU (21) is in the selection stage (102). If it is the case, the CPU (21) immediately returns to the free state (101). When the CPU (21) is in the two-step (102), the help button (66) is pressed down or it is clicked. If it is the case, it moves to the help step (106) and the CPU (21) indicates the help display. In the help step (106), the CPU (21) returns to the selection stage (102) if the final command of the help display is applied to the CPU (21).

As it is above mentioned. In order to be managed by facilities in which the trap runs each through desired any kind of mode, the one's departure from Korea standards can be freely the determination of the performance of the trap evaluated by the checked out evaluation system (2) in the management system (1) according to the explained embodiment of the present invention set up. It is not limited to the adjustment sequence for the CPU(21) be seen in fig. 16. However, but the other suitable adjustment sequence can be used.

With being indicated on for example, fig. 13 data of the trap managed by the management system (2) is stored in the memory (24) as the region prosperity and the form in which traps are arranged like the trap number. In order to make good the man operating the specific facility is the administration of the trap, several management items adding can be desired. The additional management item provides the name of company etc. maintains name and specific trap of the man managing for example, the specific trap. According to a preferred embodiment of the present invention, the special management item can be added for the better administration.

The management program provides the program which respects to add the special management item. It follows to add the management item to the management program and the CPU (21) operates to the following mode.

Firstly, the CPU (21) in which the special management item is added as to \*\*\*, gazes steadily at thing through keyboard. The CPU (21) indicates the drawing like the drawing 17 (a) in response to this command in the display unit (23). That is used for the added management item.

The drawing having in Figure 17(a) provides the item in which the inclusion heartburnings is the message of user 1 the user operating the specific facility which desires that, and the message are added or the management item indicating man, and which the list (72) is named as the respective code, description, and name. Name what is name. Name is designated for name or the code of man description is the description about each name. When the drawing of Figure 17(a) is before anything else indicated, the drawing does not have any input in code, name, and each boxes under description. In order that description is done easy, the drawing of Figure 17 (a) is the result having name from any data input of the code corresponding to code and description and user 1.

It uses, mouth, the cursor (23a) moves for the change of the content of the list (72) in desired one of the name button. Button is clicked. The drawing displayed on the drawing 17(b) by that is indicated. The drawing displayed on Figure 17(b) provides the input range (73-75) named as the respective corresponding to code, name, and description in the code, having in the list (72) displayed on Figure 17(a) name, and description. Each input range can be filled with data desiring through data input part (22). In order that that is edited, whether the part of data input of the previous which is in that is, each range or everyone is made get worse or everyone diversifies, everyone deletes.

For example, it causes that the code number displayed on this is the range (73) the display having in the code extent (72) like the code number is changed is changed.

When it was completed to edit data, the OK button (76) is clicked. This causes the change corresponding to data having in the memory (24). And then, the display returns to indicated one in the drawing 17 (a). It becomes same after the change which is made by using the display displayed on data included in the indicated picture is Figure 17(b).

If instead of pushed of the OK button (76) the cancel button (77) this. The CPU (21) does not provide the change having in Figure 17 (b) in the display for data. It has this case, and the content of the list (72) with man identically with the thing of the previous.

Displays displayed on Figure 17(a) and Figure added 17(b) are resulted in the list displayed on the new management item user 1 is fig. 13 of the list displayed on this is fig. 18 it uses. The CPU (21) processes data having in the new item user 1 after this as the management item. For example, it can become data in which data having in the item user 1 are irradiated or which are searched.

Processing data, and the item named as manufacturer etc are included the list of fig. 18. This is not indicated in fig. 13. It is this because to be the other part of the list in which figs. 13 and 18 are the same. In \*\*\* displayed on figs. 13 and 18, the height in which the other data, for example, the trap is positioned, and the operating state (the display of the paper in which for example, the piping system consecutively operates to \*\*\* in other words) of the piping system in which the specific trap is used are used. Forth is moreover stored like the part of detailed trap data which is in the memory (24).

It is explained in the state transition diagram displayed on the operation of the CPU (21) for adding the new management item is fig. 19.

Firstly, the CPU (21) enters to the free state (111). The display showing for Figure 17(a) is indicated on the display unit (23).

When having in the state (111) in which the CPU (21) is at leisure, the display of Figure 17(b) is represented, mouse is commonly used. The CPU (21) moves to the editing step (112) and the display showing is indicated on Figure 17(b) on the display unit (23). And then, by using keys having on data input part (22), it is performed on display unit displayed on addition, and the deletion and/or change is Figure 17(b) of intended data.

The OK button (76) is pressed down after the editing of intended data which is in the editing step (112) or it is clicked and the CPU (21) is moved to the item update stage (113). In the update stage (113), user 1 edited by detail data of the management item, for example, the editing step (112) is updated. And then, the CPU (21) returns to the free state (111). Simultaneously, according to the change generated in the editing step (112), the display showing for Figure 17(a) is indicated on the screen.

In order to initialize any kind of data processing, command is given in the CPU (21) having in the state (111) which is at leisure through data input part (22). If it is the case, the CPU (21) moves to data processing step (114). In data processing step (114), the CPU (21) changes about the management item of data edited with the use of the drawing showing data of each trap shown for fig. 18 for Figure 17(a) and Figure 17(b).

In order that the CPU (21) is moved from data processing step (114), one command is given through data input part (22). Thus the CPU (21) returns to the free state (111).

The receive step (115) is included besides the step (111-114). In the receive step (115), data from the checked out evaluation system (1) is received. According to the present invention, it can be performed in moreover, the checked out evaluation system (1) to edit data of the management item. In order to modify the processing performed in the management system (2) according to edited data, editing (for example, addition) of data made in the checked out evaluation system (1) is moved to the management system (2). That is, the management item managed by the management system can be edited through the checked out evaluation system (1).

The CPU (13) of the checked out evaluation system (1) can operate for this purpose to the mode which is similar to the CPU (21) of the management system (2).

It does with reference to fig. 20 and the editing session of the CPU (13) is explained. The CPU (13) enters to the for the first time free state (121). This is identical of the free state (100) which is seen in the mode (M2) which is at leisure in the thing which does with reference to fig. 6 and which is explained and the thing which does with reference to fig. 11 and which is explained. In the free state (121), the CPU (13) always waits for command.

The command for being added in the management item is given through data input part (18) in the CPU (13). The CPU (13) enters to the editing step (112). The desired management item is added through data input part (18). Whether detailed data related to the added management item are inputted or it is added, it is changed.

When data editing of the management item of the part of the new management item which was in the editing step (122) was completed in other words, the CPU (13) enters the item update stage (123). In the item update stage (123), new detailed data of that and the management item that is prepared in the editing step (122) is added to the list of trap data stored in the memory (16) edited. And then, the CPU (13) returns to the free state (121). When the addition of the new item having in the editing step (122) was canceled, while not entering the item update stage (123), the CPU (13) returns to immediately, the free state (121).

In the if free state (121), the command which respects any kind of data processing to do with initialization is given through data input part (18). The CPU (13) enters data processing step (124). Detailed data of the trap including the freshly added management item is processed.

In order that the CPU (13) is liberated from data processing step (124), command is given through data input part (18) and the CPU (13) returns to the free state (121).

In order that detailed data of the trap including the freshly added management item is transmitted in the management system (2), command is given through data input part (18) in the CPU (13) and the CPU (13) enters to the transmittal step (125). In the transmittal step (125), the CPU (13) transmits data of the freshly added management item with detailed data of the trap in the management system (2). Data are transmitted to the frame type, seen in fig. 12 for example, the form of 3 byte decimal number data. After necessary data are transmitted, the CPU (13) returns to the free state (121).

As to the management system (2), in order to receive data transmitted from the checked out evaluation system (1), the CPU (21) enters by the receive step (115). And then, the CPU (21) enters the item search stage (113) which is the place adding the management item added in the checked out evaluation system (1) included in transmitted data. Thereafter, the CPU (21) returns to the free state (111). The previously explained action is repeated.

As shown in it is above mentioned, the checked out evaluation system (1) and management system (2) each data has compatibility.

With being operated to the mode seen in the state transition diagram of figs. 19 and 20 CPUs (21, 13) are explained. However, it is operated to the different mode and but those can be arranged.

It can not be restricted to one and the number of added management items two or the item described in the above can be added.

According to the present invention, the piping drawing showing the location in which each traps are arranged can be freely drawn on the display unit (23) of the management system (2). It relates to detailed data in which traps which are in the drawn piping are stored in the memory (24). In that way the detailed information about each trap can be directly determined from the piping system.

The program for realizing this properties includes the management system. The CPU (21) operates according to the drawn program to the following mode.

The CPU (21) indicates the drawing like being indicated on fig. 21 on the display unit (23). Drop can be freely moved as left and the vertical line (30) the area ratio between the domain (32) and the domain (31) can be changed with drag or drop.

In the display space (31), the trap administration number (33) which is in the given area designated for 1 (this is indicated as the region -001) is indicated for example. As it is seen, it is vertically arranged to the order of the direction which is one by one big from the great small thing. Relatively, the minor size icon (34) is indicated on the left side of each trap number (33). Each icon (34) has the certain person corresponding to the trap of the trap number.

Arrow buttons (31a, 31b) are positioned at the right edge of the display space (31). In arrow buttons (31a, 31b) is the display space (31), the drawing is used in order to scroll the drawing. In order to show that the part of the whole trap is represented, the scroll box (31c) is positioned at the right edge of the display space (31) besides arrow buttons (31a, 31b). It presses one of arrow buttons (31a, 31b) or the scroll box (31c) twice, the thing displayed on the display space (31) can be changed.

The piping (35) for the area code 1 is positioned in the right of the display unit (32). A plurality of icons (36-40) having the size which is bigger than the icon (34) is indicated. The icon (36-40) indicates to be posted at the location at the practical piping system corresponding to their locations of the piping roadbed in which the trap is indicated. In order that traps corresponding to each icon (36-40) are easily found out, the trap number is beneath indicated of the respective one of the icon (36-40). Moreover, each icon (36-40) has the certain person corresponding to the trap indicating icon like the icon (34). In the trap number displayed on the trap number indicated in the domain (31) is the domain (32) from other, the numbers displayed on domain (31) is. The zero (0) which is in the little higher place is fired from the numbers from the domain (31).

It is connected to detailed data displayed on each icon (34) and icon (36-40) is fig. 13 or It is connected. It moves to one of the cursor (23a) is icon. The icon is the double-click (double click). And then, detailed data of the trap which comes to be double clicked is called from the memory. The display (45) at the same time, like being indicated on fig. 22 is indicated on the display unit (23). Called detailed data are indicated as the predetermined form in the display (45): Figure 22 is an example indicating result double clicking the icon (36). In the display (45), detailed data of the trap having the trap administration number 1 corresponding to the icon (36) is indicated.

In the display (45), the content of data having in the box (45a) can be changed. It moves to data box (45a) which the cursor (23a) desires. It is clicked. It can renew clicked data. The key above keyboard and mouse are used when data having in data box (45a) are renewed.

Formerly, detailed data it is explained provides the item result (fig. 15) showing the determination of data of the evaluation scheme having in the list displayed on fig. 14. The CPU (21) reflects the decision result of each icon (34, 36-40) which is in the display space (32). For example, as shown in Figure 21, the icon for the traps having the trap number 5 and 7 in which the decision result displayed on the heat of result is the malfunction are indicated as the things and the other form remaining. Accurately, the icon (37) for the trap number 5 which is in the icon (34) for the trap number 7 and the domain (32) which is in the domain (31) hides as it were. The coloring or the change over can be instead of used with thing it hides.

The display showing for fig. 21 is comprised of two independence displays falling down. The main display (47) which that is, the piping that only indicates the piping (35) indicates the display (46), the piping (35) and the other item is added on the display unit (46) (as shown in fig. 23).

By drawing the point the line character by using keyboard and mouse of data input part (22) the desired piping the drawing (46) can be prepared.

By dragging, it intersects the main drawing (47) and icons (34, 36-40) can be moved for example. In the display space (31), icons (34, 36-40) have the trap administration number (33) indicated on the right of each icons and \*\*\* is indicated as the size. When icons were dragged to the display space (32), the icons are expanded as the icon (36-40) had with the trap pipe Lee burn Hor indicated under each icons. The display (45) which shows up when one of the middle holding up with icons (34, 36-40) was double clicked is indicated on moreover, the main drawing (47).

In order that the drawing displayed on fig. 21 is prepared for, firstly the desired piping (35) which is in the desired region (the area code 001 in the explained example) is drawn on the drawing (46) for example, it results from this of the drawing seen in fig. 24. In the default, the icon everything is indicated on the left side of the display space (31) as it is seen in fig. 24.

And then, as the icon for the trap having for example, the trap number 1 is indicated in fig. 24 with the anguloso-undulate line arrow, it is dragged and one of the icon (34) which is in the right display space (31) is dropped on the piping (35) in the desired location. In the piping system, the location according to the practical location which is the trap number 1 is arranged. It becomes with the drawing it shows in fig. 25 indicating the thing displayed on the location in which as to this, the desired icon 36 (34) for the trap number 1 desires. When the icon (34) for the trap number 1 was moved in the display space (32), as icon and trap number are indicated with the arrow (31d) of fig. 26, icon and trap numbers are moved to the high order from the low net.

In the method which is similar to this, the icon (34) for the traps having the administration number 2, 3, 5, 6 is dragged in the desired location on the piping (35) or the icon (34) for the trap is dropped. Thus, in conclusion, it is indicated to show in fig. 21.



In order that the CPU (21) realizes the drawing of the piping (35), in order that the display of icons (34, 36-40) is realized on the drawing including the piping (35), detailed trap data are operated according to the state transition diagram displayed on fig. 26 the expression of the display (45) had is realized.

As indicated in fig. 26, the CPU (21) the free state (55), and the piping pass through the drawing step (56), the icon moving step (57), the detailed data display step (58), data update step (59) interval.

In order to wait for command from data input part (22), the CPU (21) enters to the first by the free step (55). The thing, in which data input part (22) operates that is, the keles on mouse or keyboard operate, the managed region is selected by the reability of ooooo.

The command initializing the drawing of the piping (35) after this is given with mouse or the keles. As to this, the CPU (21) the piping enters the drawing step (56). In the step (56), the desired piping (35) is drawn on fig. 24 with the means of mouse or the key by the mode like the measure thing in the table. Mouse or the key is used when it informs the CPU (21) of something when the drawing of the piping (35) was completed. And then, the CPU (21) returns to the free state (55).

Thereafter, as it is indicated with the arrow of the broken line profile in the drawing 24. It is selected in the free state (55) or the desired icon (34) is dragged. When the dragging of the icon (34) was initialized, the CPU (21) is moved to the icon moving step (57). In the step (57), the CPU (21) moves icon in response to dragging. And then, the icon 34 (36) is dropped to the desired location on the piping (35). It fixes that with the location and the CPU (21) returns to the free state (55).

As indicated in fig. 21, when the desired icon, for example, the icon (36) was selected and it was double clicked, the CPU (21) enters the detailed data display step (58). In the detailed data display step (58), the CPU (21) calls detailed data of the trap corresponding to the icon (36) selected from the memory (24). And as indicated in at the same time with that, fig. 22, the display (45) is indicated in on the screen. The CPU (21) indicates called detailed data which are in the display (45). The command for terminating the detailed data display step (58) is given to the CPU (21) through mouse or the key. The CPU (21) returns to the free state (55).

In the detailed data display step (58), it is moved to one of the indicated data box (45a) which is in the display (45) and the cursor (23a) is clicked. This inputs the CPU (21) having in data update step (59). In data update step (59), it can change the mode indicating data box (45a) which is selected by changing the characters and natural disposition and data having in the box (45a) the CPU (21) is indicated for example to be updated. And then, in order to input new data it is operated as mouse or the keles. It is updated in data having in the selected box (45a). And then, the CPU (21) returns to the detailed data display step (58).

As it is explained in the upper part. According to the present invention, the piping (35) and icon (36-40) are simply looked at. Accordingly, icon (36-40) are positioned on for example, that. Accordingly, icon (36-40) are easy to understand the positional relation between detailed data of the trap and the trap.

The icon for the trap breaking down is indicated as the icon for the superiority trap and the other method. It is easy to confirm to be the same as that of the trap breaking down.

Moreover, trap, it has the piping drawing with \*\*\* quality number. Therefore it can be freely moved to any location from the piping roadbed and and, icons can be located. Therefore the diversity of the piping system can be dealt in.

In the above case, in the explained example, the piping drawing is drawn on the display screen. However, the plan of facility can be drawn and the icon for the trap can be but located on such plan. The alternative high, and the picture information for each trap, for example, photographs can be stored as the part of detailed data of each traps which are in the memory (24). Photograph or the drawing of the trap can be indicated with detailed data.

The management system (2) of the present invention has the skill of deciding the order of the trap which the checked out is estimated by the checked out evaluation system (1) in order to provide the most effective operation. This crystallization is performed by using detailed data of each trap.

The management program provides the trap checked out valuation order crystallization program. According to the CPU (21) is the management program, it operates to the following mode.

The CPU (21) indicates the drawing firstly like being indicated on fig. 27 in on the screen of the display unit (23). In order to select the trap which the checked out is evaluated, this drawing is used. This drawing provides the six windows (81-86) arranged to 2 row and 3 heat.

In order to choose the domain examining the trap and is arranged, the left Wei-Ts'ang (81) is used. The area code (81a) is indicated. It is vertically arranged having the blind angle check box (81a) having on each area code left.

For example, when the area code 1 was selected, the cursor (23a) is moved on the check box (81) for the area code 1. It is clicked to the left button of mouse in order to mark check in the box. This indicates that the region 1 is selected. One or more regions can be instead of selected.

The , word region (81c) indicates on the left corner of the window (81) that the window has the check box (81d) in which the region selection window is located on the left of that. When the check box (81) was marked, the selection of the region formed in the window (81) is effectively made. By the result of that it clicks the left button of mouse by moving moreover, the cursor (23a), the marking of the box (81d) is performed. By clicking for example, the marked box, the check mark in check boxes (81b, 81d) is removed.

In order to scroll the display having inside the window (81), arrow buttons (81e, 81f) are located under the top of the right edge of the region selection window (81) and man. When one of two buttons were pressed down, the display scrolls the upper part or the lower part and the display foreground, which it is not seen that is, the area code 6 shows up in the window (81). As the display is scrolled, the scroll box (81g) which is in the scroll bar expanding two arrow button intervals downwards moves as upside. Moreover, the scroll box (81g) is used when by the box (81g) being scrolled and moving the upper part or the cursor (23a) done dragging, the display is scrolled.

The center window (82) which is in the upside heat is the application preference window for selecting the application of the inspected trap. The C-Dryer (cylinder is constructed) the plurality application of the trap is indicated in the window (82), and the thing (for the clogged piping), the heating (place is heated), the process (the piping is processed), probe (for measurement) falling down are included. It is similar to the structure silver window (81) of the window (82). The detailed description does not give. However, the character which is the same for the item seen in the window (82) which is similar to the thing corresponding to the window (81) is adhered to the end of the reference figure 82. For example, it examines the trap used for the cylinder drying piping, main piping system, the heating piping system, processing piping system. If it is the case, it is marked with the check box (82b) located at the C-drier, the thing, falling down heating, and the right of the process.

It respects to do. Effective the box (82d) is marked with the check mark.

The window (83) is used for the steam pressure of the place where traps which the checked out are evaluated are used. It is attached to the end of the reference figure 83 for the item in which the detailed description therefore does not give indications indicated in the window (83) with the structure of the window (83) but is similar to for example, 0-50 (pressure less than 50psi over 0psi), 50-150 (pressure less than 150psi over 50psi), 150-300 (pressure less than 300psi over 150psi), 300-600 (pressure less than 600psi over 300psi), 600 (the pressure described in the above than 600psi or that), window (81) which same characters are similar. It examines the trap which becomes in the piping system having the steam pressure of 300psi from 0psi. If it is the case, the check box (83b) is marked on 0-50, 50-150, and the right of 150-300.

For hour of the Dongah, in which traps are evaluated with checked out provisional planting, the window (84) of left is used. The window (84) provides for example, the display of 0-12 (12 month from 0), 13-24 (24 month in 13 month), 25-36 (36 month in 25 month), 37-48 (48 month in 37 month), 49-60 (60 month in 49 month). For example, it examines the trap used for one year or less. If it is the case, the check box (84b) above the right of 0-12 is marked. The structure of the window (84) structure and \*\*\* door any detailed description of the window (81) does not give but the same character is attached to the end of the reference figure 84.

It examines the window (85) for the priority or the significance of the trap when being in the lower row. In the window (85), the important with M- and Important general, the Aux (of secondary), and another (the for example only important (relatively it is important (it is most important)) winter) are indicated for example. In order that the most important trap is checked out, the important with M- and Important check box (85b) of general humanity and justice right is marked with the general trap and the trap. Relatively important. The structure of the display (85) be similar to the structure of the window (81). Therefore it be any more the detailed description about that not issued. However, same characters are attached to the end of the reference figure 85.

The right window (86) which is in the lower part heat is to select the trap type. The window (86) provides for example, the display including the bucket (the bucket type trap), the disc (the disc type trap), the float (the float type trap), the THERMO (the automatic temperature control trap), TEMP ADJ (the temperature control trap), etc. In order that the bucket type trap, the disc type trap, and the automatic temperature control trap are evaluated with checked out, the check box (86b) which is in bucket, disc, and the front of THERMO is marked with together with thing. It looks. But in the explained example, the check box for the trap type is marked. Therefore it can select the trap of any types. The structure of the display (86) is similar to the structure of the window (81). Therefore consequently it does not give any description about that but the same character is adhered to the end of the reference figure 86.

After each window (81-86) the desired item having in inside is selected, the selection which is located in the right edge of screen by moving the cursor (23a) in the box (87) and clicking the left button of mouse is pressed down and it determines the button (87). And then, the CPU (21) irradiates detailed data of the trap including to become for that data in which the everyone of the items which are set up in each window (81-86) is satisfied in fig. 13 with foot. For example, the cylinder drying piping, main piping, heating piping, processing piping system which as indicated in the option button (87) is fig. 27, when is pressed down that it sets up item, the CPU (21) has the steam pressure which is 300psi or less for the trap used for the area code 001 with 0

With instead of pushing the option button (87) the button (88) the cancel having under the option button (87) is discriminated to if. The CPU (21) closes the display of the drawing of fig. 27. The button (88) is pressed down with nothing degree and has under the cancel button (88) it is defeated with the name paper wars. If it is the case, all establishments are cleared so that all check marks that are in the check box disappear. The button (88) having under any thing drawing button (88) is pressed down. If it is the case, it is marked with all check boxes (81b, 82b, 83b, 84b, 85b, 86b).

The display is diversified to the thing like the display displayed on the CPU (21) is fig. 28 inspection is finished with the CPU (21). This drawing (like 1) includes that the trap number (91a) is inspected. It irradiates by using the area code (the area code 1 in the explained example) drawing 27 of the selected region.

The drawing of fig. 28 is used when the order of the investigation of the selected trap is decided.

The drawing provides the arranged thing in which two displays (91, 92) is horizontally adjacent. The trap administration number (91a) of the trap found is indicated in the window (91). The trap number is arranged to the following sequence increasing order to the minor number located on the provisional planting. The left of each trap number, the area code (91b) of the region in which the trap is located is indicated.

Moreover, the left of the area code, the icon (91c) having the shape indicating the type of the trap is indicated. It is the mode which is similar to the thing for the window (81) displayed on the scroll box (91f) is fig. 27 arrow buttons (91d, 91e) are used.

It desires that it examines the trap having the trap number 5. If it is the case, the cursor (23a) is moved on the left of the number 5 in the area code (91b). The mouse button is clicked. By knowing that the trap having the trap number 5 is selected, this causes the inversion of the area code display. And then, the cursor (23a) is moved to the thing (93) which is in four arrow buttons (93-96), located in the space between windows (91, 92) provisional planting, the upper part. And by using mouse, it pushes or mouse is clicked. This causes the area code 1 relating to the trap number 5 and the icon which is moved from the left window (91) to the right window (92) relating. Simultaneously, as the more big trap number (91a), which is indicated under the moved trap number 5 the area code (91b) and the icon (91c) having relation with their are indicated by the arrow (51h) on fig. 29, the window (91) is moved to the top.

The selected trap 1 display having on the window (92) indicates that the selected trap number is 1.

The same processing is repeated for all traps remaining in the window (91) to the desired order of the checked out and with being explained in fig. 30 this is indicated. In the display (92), the trap number (91a), their area codes (91b), and their icons (91c) are indicated. Their icons (91c) are arranged in the selected order to the vertical downward direction. The selected number of the trap, for example, 18 is indicated as the selected trap 18. The window (91) is now empty.

As indicated in buttons (92a, 92b) which when you nothing cursor them everything the trap number (91A), the area code (91b), and the icon (91c) moved to the display (92) cannot be indicated in screen, have the top, the arrow down and scroll box (92c), is fig. 30, it is automatically indicated on the right edge of the window (92). Using arrow buttons (92a, 92b) and scroll box (92c), the downwards can be scrolled to the display as upside. In the meantime, when it any more does not have the need to scroll the display having in the window (91), arrow buttons (91d, 91e) and scroll box (91f) disappear from screen.

In even if, fig. 30, it does not become the detailed display. However, the is in the window (92) order desires to change the order which of trap numbers. If it is the case, the cursor (23a) is moved for the trap number (91a) of the moved trap in the area code (91b). And then, the left button of mouse is clicked. This inverts the display of the area code (91b). After one of upside, downwards, the direction paper portrait of a king arrow button (97, 98) two are pressed down, as to this, the selected trap administration number (91a) causes upside or the to be downwards moved thing. The checked out order of the selected trap can be changed with the order of the trap selected to be this mode.

In order to remove anything of the trap which is in the window (92), the cursor (23a) is moved in the area code which is in the trap number front of the removed trap. And then, the left button of mouse is clicked. This causes the inversion of the area code display. The button (94) having the arrow kindhearted in a clockwise direction is pressed down on thing displayed on region between the window (91) after \*\*\*, and the window (92). This causes that the administration number (91) of the trap is removed from the list having in the window (92). The area code (91b) of that and icon (91c) of that are again moved to the display (91). Therefore, the selection of the desired trap is canceled.

The button (95) having the direction paper was gin arrow in a clockwise direction of two displayed on region between the window (92) and the window (91) it has to be moved to the display (92) at a time rather than it is one of the message displayed on it, the window (91) is pressed down. This causes that all things indicated in the window (91) are moved to the window (92) at a time.

It desires that the display having in the window (92) is removed in the display (91) at a time. If it is the case, the button (96) having the direction paper was gin arrow in a counterclockwise direction of two is pressed down.

As indicated in the button (99) having the display of the storage displayed on the right of the window (92) the re-ordering of the inspected trap is completed is fig. 30, it is pressed down. And then, the CPU (21) does the operation of storing the rearranged result of having in the memory (24) or memorizing. According to this, the order checking out the trap with the checked out evaluation system (1) results. If the button (90) having cancel instead of the button (99) pushed, the CPU (21) stops the checked out order. It respects the detailed chapter with the selection (for example, search) below and the button (80) having the display of the everyone which shows for fig. 27 having arrangement displayed on figs. 27 and 28 is pressed down. By using the display showing after \*\*\* for fig. 28, it can select from them to desires.

The operation of the CPU (21) of the management system (2) for deciding the trap checked out order can be expressed as the form of the flow chart shown for fig. 31.

Many condition for the search for the trap selected to be the first can be determined as the mode which does with reference to Figure 27(step S2) and which is explained. And then, according to the condition (step S4) which the option button (87) is determined, so that the CPU (21) search detailed data of the trap from data stored in the memory (24), it is pressed. For example, it is performed according to the flow chart shown in search is figs. 32a and 32b.

The CPU (21) is detailed data of all traps is extracted from the recognition of the option button (87) which is in the step (S200) it presses (step S202).

Next, the CPU (21) checks that the check box (81d) having in the region message the front having in fig. 27 is indicated as the check mark (step S204). If, the box (80d) is \*\*\* (that is, answer is YES) many sides, and the CPU (21) provide the marked area code (s) which data is indicated in the region selection window (91) all traps extracted in the step (S202) extract from detailed data (step S206). At the next step, at the next step, extracted data are irradiated. It is discovered (that is, answer is NO) that the check box (81d) for region is not marked. If it is the case, the CPU (21) is \*\*\* in the step (S206) to the step (S208).

In the step (S208), the CPU (21) the check box (82d) checks for the application having on the box (82) which is in fig. 27 to check whether it is marked or not. If that is, answer is YES, the CPU (21) extracts data from the step (S206) or the step (S204) and then then marked trap data of the application (S) is extracted in the application window (92) (the step S210). It is discovered in the step (S208) (that is, answer is NO) that the check box (82d) for application is not marked. If it is the case, the CPU (21) skips from the step (S210)

to the step (S212).

In the step (S212), the CPU (21) checks whether the check box (83d) for the pressure indicated on the box (83) having in fig. 27 is marked or not. It is data of the trap used for the piping system having the steam pressure (S) indicated on the pressure window (83) displayed on fig. 27 the then (that is, answer is YES), and the CPU (21) extract data from the step (S210) or the step (S208). Extracted data are simple to be influenced has in the step (S216). The CPU (21) skips from the step (S214) to the step (S216) if the check box (83d) is not marked with it.

In the step (S216), the CPU (21) the check box (84d) for the use month count checks on the window (84) which is in fig. 27 to check whether the check box (84d) is marked or not. The box (84d) is marked with If. The CPU (21) extracts data from the step (S214) or the step (S212). It is marked with data of the trap used for the time period in the window (84) (that is, answer is the YES mask) (the step S218). The check box (84d) is not marked with If (that is, answer is NO). The CPU (21) skips from the step (S218) to the step (S220).

In the step (S220), the CPU (21) inspects whether the check box (85d) for the priority indicated on the window (85) having in fig. 27 is marked or not. If the box (85d) is marked with If, If the answer about the question is YES, the CPU (21) extracts data from that is, the step (S220) from the step (S218) or the step (216). It has the marked priority data of the trap in the window (85) (the step S222). In the meantime, the check box (85d) is not marked with If (that is, answer is NO). CPU skips from the step (S222) to the step (S224). In the step (S224), the CPU (21) inspects whether the check box (86d) indicated on the window (86) having in the drawing 27 for the trap type is marked with the check mark or not. The CPU (21) extracts data from the step (S222) or the step (220) if the box (86d) is marked with If. It is marked with data of the trap type (S) in the window (86) (the step S226). And then, the CPU (21) finishes the inspection of data step (S4) (fig. 31). In the meantime, It is the thing (that is, solution is NO) in which the check box (86d) is not marked in the step (S224). If it is the case, the CPU (21) jumps across the step (S226). The illumination stage (S4) is finished.

And then, the CPU (21) shows the investigation result performed in the step (S4) in fig. 28 as the thing indicated form. Indicated data provides the trap administration number (91a) of the trap of detailed data, extracted according to the flow chart displayed on figs. 32A and 32B the area code (91b), and the icon (91c). It is rearranged with extracted data as the mode which does with reference to figs. 28 and 30 and which is explained (the step S8). And rearranged data are stored in the memory (24) of being the end of the management program having the flow chart of fig. 31 as the basis (the step S10)

According to the present invention, it can be moved to the management check evaluation system (1) and the trap checked out order determined on the mode explained in the management system (2) is checked on the system (1).

Particularly, after the trap checked out order is determined on the management system (2), as been indicated in fig. 1, the management system (2) is connected to the cable (3) to the checked out evaluation system (1). And then, in order to receive data from the management system (2), the checked out evaluation system (1) is set up as the mode which concretely is not discussed. Thereafter, data are moved to the checked out evaluation system (1) from the management system (2). Here, the trap checked out order is stored in the memory (16) of the checked out evaluation system (1). Stored data of the trap checked out order provides at least, at least, the trap administration number, the area code, and the trap model name.

The active system (2) falls the cable (3) down with \*\*\* from the checked out evaluation system (1) after the trap checked out order is moved in the checked out evaluation system (1). The checked out evaluation of the trap is initialized to the checked out evaluation system (1) after this.

Figure 33 shows the flow chart of the operation of the CPU (13) of the checked out evaluation system (1). The program seen in fig. 33 is stored in the regulation program domain (163) having in the memory (16) of the checked out evaluation system (1) as a portion of the control program.

The CPU (13) indicates by the first by the form showing the area code of the first thing of the traps transmitted from the management system (2) to the determined order on the display unit (17) and administration number in fig. 5 (step S302). Accurately, the trap administration number (172) having the character NO following with the area code 171 and the hyphen positioned between numbers (171, 172) is indicated on the upside heat as it were. In the lower part heat of this display, the character MODEL and trap model name (173) are indicated.

The correlation data (D) is called from the trap data displayed on the CPU (13) is fig. 3 for the trap model name (173) (step S304). The checked out and evaluation are initialized with that (step S306). And then, operator adds pressure toward the surface of the housing of the first trap (not illustrated) which is the probe (1) inspected. In case of the example displayed on fig. 5, the model name as to the inspected trap, is before anything else JKL. The administration number is used in the region having 5, and the area code 1. The checked out evaluation is not whether the checked out evaluation of all traps was finished, or not the checked out evaluation is tested (the step S308). If the solution about the question performed in the step (S308) is NO, this means that it has the inspected and another trap. The CPU (13) indicates the area code (171), and the model name of the trap which next the checked out is estimated and trap administration number (172) on the display unit (17) (the step S310). And then, the CPU (13) returns to the step (S304). Until the selected trap everyone is the processing provided to 8 step (S304) through the step (S308) evaluated with checked out, the processing is repeated.

If the selected trap everything was evaluated with checked out, the solution about the question is YES in that is, the step (S308), the CPU (13) indicates the message (not illustrated) indicating all traps that the checked out are evaluated on the display unit (17) (step S312). And then, the operation explained in fig. 33 is finished.

As been above mentioned, according to the present invention, it is selected in facility only the desired thing of the use measure presence of the King trap number. The desired thing is arranged to the desired checked out order. So, the checked out evaluation of the efficient trap can be realized.

In the checked out evaluation system (1), after being inspected, the model name (173) of the trap is indicated on the display unit (17)

with time, area code (171), trap administration number (172) the trap is evaluated with checked out. Therefore, the off radar easily can know next if it examines any kind of trap. Simultaneously, the indicated correlation data (D) for the trap is automatically set up for the checked out evaluation of the trap. That is, need does the special step for calling the necessary correlation data (D) not have as to operator.

In the above case, the condition of the complementary stone is explained as the basis for irradiating the inspected trap. Those are the time period, in which the area code, the use of application or the trap, the steam pressure, and the trap is used the priority or the significance of the trap, and the trap type. But in the above case, the need to be limited that it is discussed does not have the conditions. For example, the operation state (it in other words is discontinuously operated as for example whether the piping system is operated as consecutively or not) of the piping system including trap model name manufacturer, the level (height), and trap etc. can be used as the basis. As to the level (height), the trap is positioned.

Data can be arranged in order to investigate data of trap satisfying the condition, it investigates data, and still, that the program is set up. At least, one of the trap satisfying the explained program is set up conditions.

In the explained example, the inspected and extracted order of the trap can be passively changed. However, as indicated in fig. 21, the re-ordering of data is automatically performed based on the positional relation between the trap for example. For example, according to distance from the input in the facility which the trap specifies, it is rearranged in automatically.

In the above case, in the explained example, the inspected trap is indicated on the display unit (17). However, that is outputted to the form of the sound. For example, it can be known via the megaphone relating to the checked out evaluation system (1) which is the inspected trap and is arranged.

Disclosed is the thing which CPUs (13, 21) of the management system (2) and checked out evaluation system (1) are operated to the mode expressed in the flowchart indicated in respective figs. 33 and 31. But those can operate to the other mode in which the same effect can be obtained.

In the explained example, the steam pressure of the inside of trap side can be directly determined by detecting the temperature of the surface of the trap housing. But the exact steam pressure of the inside of trap is known. If it is the case, that can be manually inputted through data input part or the keys. The exact use of the steam pressure can evaluate the more exact trap than it directly uses the obtained steam pressure. Moreover, the high accuracy does not obtain from the evaluation. If it is the case, the measurement of vibration is used in the thing which only evaluates the trap or with calculating the steam leakage the measurement is used.

The present invention is explained by the system for evaluating the steam trap the checked out and managing. However, it is identical in the other trap, for example, the system for the air trap and gas trap, the present invention can be applied to. Moreover, the present invention can be applied to the system for evaluating the other apparatus, for example, valve and rotary machine the checked out and managing.

It need the management system (2) to not need for the personal computer but be comprised as the dedicated system.

The checked out evaluation system (1) and management system (2) were illustrated as the respective system falling down. However, those can be integrated in one system.

#### ■ Effects of the invention

According to the present invention, the check on equipment evaluation system for checked out evaluation each apparatuses forming facility provides the main part memory part in which a plurality of inspection data processing sequences for processing data which is obtained by checking out one of plurality of the equipment forming facilities is stored. The auxiliary memory part moreover includes the system. One sequence reservoir told part externally accepts one or more applied sequence store instruction. One of inspection data processing sequence stored in the memory units are selected according to accepted one or more sequence store instruction. The selected inspection data processing sequence is stored in the auxiliary memory. The sequence calling party which externally accepts the applied sequence call instruction corresponding to one of system is the apparatus is more included. The inspection data processing sequence stored in the auxiliary memory corresponding to the sequence call instruction accepted is selected.

The inspection data call processing accepts inspection data obtained with the checked out of being practical of one apparatus. Inspection data which is accepted so that the inspection data processing sequence evaluate the apparatus as long as the inspection data processing sequence for one apparatus is called with the sequence calling party, the inspection data processing sequence complies with and it is inspected is processed. The processing result is outputted.

The main memory part includes the inspection data processing sequence for the mostly commercially available apparatus everyone who is the same as that of the steam trap for example. This means that many inspection data processing sequence of number is stored in the main part memo rib.

The inspection data call processing processes data which is obtained by the result of that the inspection data processing sequence inspects the specific apparatus in order to evaluate the operation of the specific apparatus based on the inspection data processing sequence for the specific apparatus. That is, other sequences are used for another apparatus. Therefore, the evaluation of being ascertained of the apparatuses is used.

Inspection data processing sequences are stored in the main memory part. It is not easy to the number of this sequences therefore position desired one among them,



The sequence reservoir fold part only selects for apparatuses evaluating sequences selected in the auxiliary memory part and store among inspection data processing sequences having in the main memory part only one. Sequence store instructions are applied to the sequence reservoir fold part, it answers and selection and storage are the inspection data processing sequence performed in the auxiliary memory part. When the specific apparatus was evaluated, the sequence calling party calls the desired processing sequence corresponding to the specific apparatus for being stored in the auxiliary memory part. Therefore, the desired sequence is selected from the small number of the sequences and selection is easy.

Apparatuses forming facility can be various another types. The auxiliary memory part continues for the type of each apparatus with number. Includes a plurality of save areas. It corresponds to each sequence store instruction stored in the save area of the auxiliary memory part for the type of the apparatus for complying with for the inspection data processing sequence and being evaluated and the sequence reservoir fold part causes the inspection data processing sequence. The sequence call instruction provides the sequence select instruction for selecting desired one among the type selection command and for selecting desired one among the types of the apparatuses out and inspection data processing sequences out. One of save areas which the sequence calling party comes under the type corresponding with the type selection command and is selected are selected. Desired one of the inspection data processing sequence stored in the selected save area corresponding to the sequence select instruction is called.

Auxiliary memory part are divided into several plurality save areas. It complies with for the type of the apparatuses corresponding to each inspection data processing sequence and the inspection data processing sequence stored in auxiliary memory part is classified. The type is stored in save area for each types. The sequence calling party selects save area as the first for the type coinciding with the type selection command. For example, the type of the apparatus is evaluated. And then, the sequence calling party calls the inspection data processing sequence corresponding to the sequence select instruction. For example, the sequence for the apparatus is evaluated. The sequence is stored in the base domain selected from the processing sequence. Selected domain from the inspection data processing sequence is more subdivided.

The check on equipment evaluation system according to the point of view of the present invention is equipped with the sequence memory unit which is provided in order to check out a plurality of apparatuses and evaluate, and includes one or more traps and one or more valves, and forms facility, and stores the trap point gum evaluation sequence of doing checking out the trap in the piping system and evaluated. In the sequence memory unit is the piping system, it stores in the valve checked out evaluation sequence of performing to check out valve and evaluate. One of evaluation sequence of the trap in response to the sequence select instruction which the sequence selecting unit corresponds to the apparatus which is evaluated it is inspected and is externally applied to and valve are selected. System more includes the checked out of being selected with the sequence selecting unit and the unit check evaluation portion which is according to inspect the apparatus coinciding with the evaluation sequence and evaluate.

The term trap is used for the description of the application showing the steam trap arranged in the steam line like for example, the air trap compressing the air piping or the gas trap arranged in the gas piping. Moreover, there can be for example, the auto valve or the pressure control valve etc. the valve canning be manipulated is expressed as the term valve is hydraulic.

The sequence memory unit provides the valve checked out evaluation sequence implying the trap point gum evaluation sequence of checking out the trap and evaluating but being used, and of checking out valve and evaluating but being used. The sequence select instruction selecting the trap point gum evaluation sequence is externally applied to the sequence selecting unit. The sequence selecting unit selects the trap point gum evaluation sequence. It checks out the trap coinciding with the trap point gum evaluation sequence of being selected and the equipment maintenance evaluation sequence in response to the sequence select instruction for valve is applied to for the checked out and evaluation of valve. According to the equipment maintenance evaluation portion check out valve and evaluate, the sequence selecting unit selects the valve checked out evaluation sequence. Therefore, in the single checked out evaluation system, the checked out of the trap and valve both sides and the evaluation of being ascertained can be performed.

Provided is the check on equipment evaluation system for the checked out last equipment having a plurality of apparatuses for including one or more traps and one or more valves according to the property of another of the present invention. This system provides below \*\*\* valve checked out evaluation sequence the sequence memory unit, storing the trap point gum evaluation sequence of respecting it does it evaluates it checks out the trap in the piping system and the execution checking out valve in the piping system and evaluated. One of trap point gum evaluation sequence in response to the sequence select instruction which the sequence selecting unit corresponds to under apparatuses which are evaluated it is inspected and is externally applied to and valve checked out evaluation sequence two are selected. System provides the unit check evaluation portion having the first and the second checked out evaluation mode in which it can be moreover replaced. In one of first and the second checked out evaluation mode two which the unit check evaluation portion is selected in response to the mode preferences command externally applied to, it evaluates with the checked out of the apparatus. When it is the first mode, it coincides with the checked out evaluation sequence of being selected by the sequence selecting unit and it inspects the apparatus and the unit check evaluation portion evaluates. When it is the second mode, it checks the predetermined number out and the unit check evaluation portion evaluates. For example, it complies with to select one of checked out evaluation sequences and two (the thing checking out the same trap and evaluates or checks out valve and evaluates as the same times in other words, and the current case twice) of valve and trap are selected by the sequence selecting unit. And the same number is checked out and then, it evaluates. That is, in this case, two (the thing, which checks out the same valve and which checks out valve and evaluated as the times which is the same as that of \*\*\* field in other words that is, two) of the valve or the trap comply with for the other evaluation sequence. The replace of bimodals is automatically performed.

The sequence memory unit provides the trap point gum evaluation sequence and valve checked out evaluation sequence. Area, if it assumes that it examines the trap and it is evaluated, the sequence select instruction for selecting the trap point gum evaluation sequence is applied to the mode preferences command for selecting the first checked out evaluation mode. The sequence selecting unit selects the trap point gum evaluation sequence. It coincides with the trap point gum evaluation sequence and it checks out the trap and the unit check evaluation portion evaluates.

In the meantime, if it is only evaluated only valve, the sequence select instruction for selecting the valve checked out evaluation sequence is applied to the mode preferences command for selecting the first checked out evaluation mode. And then, the sequence selecting unit selects the valve checked out evaluation sequence. It coincides with the valve checked out evaluation sequence and it checks out valve and the unit check evaluation portion evaluates.

In order that the trap and valve both sides are appraised, the sequence select instruction for selecting the apparatus is evaluated at the very first. For example, the trap is applied to system with the mode preferences command for selecting the second checked out evaluation mode. And then, the sequence selecting unit selects the trap point gum evaluation sequence. It checks out the number (for example, 2) coinciding with the trap point gum evaluation sequence and predetermines and the unit check evaluation portion evaluates. If the checked out of the number of the trap and the evaluation of predetermining are completed, it coincides with the valve checked out evaluation sequence and it begins to check out the same number (for example, in this case, 2) of valve and the unit check evaluation portion begins to evaluate. Until the desired number of valve and trap is estimated with checked out, the checked out evaluation of the trap and checked out evaluation of valve are by turns performed after this. If the number each checked out of predetermining of the apparatuses has to be estimated. The apparatus for being the same has to bear in mind to the checked out can be estimated as the times predetermining.

The checked out evaluation of valve performs into the first. If it is the case, the sequence select instruction selecting the valve checked out evaluation sequence is applied to.

The check on equipment evaluation portion of the check on equipment evaluation system provides the vibration pickup part for detecting vibrations generated in each apparatus. The vibration pickup part provides vibration sign data expressing the detected vibration. Moreover, the checked out evaluation portion includes the detection data processing block, where the detection data processing block processes vibration sign data coinciding with the checked out evaluation sequence of receiving vibration sign data from the vibration pickup part and being performed and is accepted. According to the stored cross relation with the oscillation amplitude of the fluid leakage amount which the trap point gum evaluation sequence is controlled with each trap and the trap caused by the fluid leakage, the detection data processing block processes the vibration sign data. Amount of the fluid leakage through the trap can be calculated with that. The valve checked out evaluation sequence calculates the oscillation amplitude of each valve to the detection data processing block from vibration sign data.

Here, the used term fluid shows the steam when for example, the trap and valves are used for steam lines. In the traps and the valves used for the piping for the press air, the fluid is the press air. The traps and valves are used for the piping for the gas. If it is the case, the gas is the fluid.

According to the above-described system, the fluid leakage amount is calculated from level or the size of the supersonic vibration generated in the trap when the fluid leaks through the trap. Little more, the housing of the trap particularly causes the fluid leakage as it were. Calculation of the fluid leakage amount is performed with the oscillation amplitude or the level of the trap based on the fact that the fact has relationship. According to the trap checked out evaluation sequence, in order that traps are evaluated, the vibration pickup part detects the vibration generated in the trap housing. Detected vibration sign data expressing the detected vibration is provided. Data from the vibration pickup part is processed in the detection data processing block in order to reckon the fluid leakage amount.

The fluid leakage amount through valve the checked out evaluation of the valve according to the valve checked out evaluation sequence is based on valve or the fact generating the supersonic vibration in the valve housing. The vibration pickup part detects the vibration of the valve housing. In order to calculate the size or the level of vibration, processed and detected vibration sign data is provided to the detection data processing block.

Generally, valve are easy to be influenced in the minute vibration caused by the environmental noise. According to the present invention, the vibration generated in valve can determine from the oscillating level calculated by the detection data processing block in other words whether it is thing by the environmental noise or not whether it is thing by the fluid leakage amount or not.

The apparatus check on equipment evaluation system of the present invention is equipped with the vibration pickup part, providing vibration sign data which expresses the detected vibration it detects the vibration generated in apparatuses the temperature detection station providing temperature display data which indicates the detected temperature it detects the temperature of the apparatuses, and the detection data processing block processing vibration sign data and data receiving temperature display data and is received according to one among the checked out evaluation sequence being used currently. According to the stored correlation between the oscillation amplitude of the fluid leakage amount in which the trap point gum evaluation sequence the detection data processing block is controlled with the trap and the trap caused by the fluid leakage, vibration and temperature display data are processed. According to this, the fluid leakage amount through the trap can be reckoned. The valve checked out evaluation sequence the detection data processing block calculates the size of the vibration in valve from vibration sign data at least.

According to this property, the fluid leakage amount of the inside of trap is calculated according to the trap point gum evaluation sequence from the detected oscillating level. It is according to due to leakage and fluid leakage and it is calculated based on the correlation existing between the level of the supersonic vibration generated in the inside of trap. But correlation between the oscillating level and the fluid leakage amount austere depend on the pressure of the fluid of the inside of trap as it were. Concern has the fluid pressure of the inside of trap and temperature of the trap. Therefore, it is detected by the temperature of the trap with the temperature detection station. In order to indirectly obtain the fluid pressure of the trap inside, detected temperature display data is processed to the detection data processing block. Process vibration sign data detected based on the correlation having the fluid pressure to parameter, the fluid leakage amount is calculated.

In the meantime, the checked out evaluation of valve does based on the supersonic vibration generated by the fluid leakage through valve in valve. The detection data processing block therefore processes detected vibration sign data to calculate the size of the vibration in which the valve checked out evaluation sequence is generated in valve. According to the property of being like that of being discussed, the detection data processing block is supplied with detected temperature display data indicating the temperature of valve in detected \*\*\*. Process temperature display data detected in the detection data processing block, the surface temperature of valve can find.

Moreover, the present invention oversees the installation management system. The installation management system provides classifier and analysis section. Classifier classifies the predetermined type number of the evaluation result which is obtained by evaluating each of condensing equipments forming facility into the multi step including the first and the second step the checked out. The

\*analysis section analyzes classified evaluation results.

The first and the second step express the normal operation (GOOD) of the apparatus and malfunction (DEFECTIVE) of the apparatus.

According to the present invention, the evaluation result classified as the superiority or the malfunction can be determined according to the management planning of the man operating for example, facility on classifier at its convenience. With being classified in classifier the analysis section analyzes the evaluation result. It can determine the man working facility according to the standard mind the man determines whether facility each apparatuses are normally or not whether it is the malfunction, or not of following. Therefore, it can become the maintenance and administration of facility to the mode desiring by the man working facility.

The present invention is to provide the readable computer record medium in which moreover, the facility management program is recorded. In order to perform the classification sequence for classifying the evaluation result which is obtained by evaluating each apparatuses comprising facility with the multi step including the first and the second step with checked out, computer is operated in the facility management program. Moreover, with being classified according to the classification sequence as to computer, the analysis sequence for the analysis performs the evaluation result.

The recording medium can be the soft disc (flexible disc, FD), hard disk, magnetic tape, CD-ROM, the magneto optics (MO) disc, DVD, paper tape.

The first and the second step express the normal operation (GOOD) of the apparatus and malfunction (DEFECTIVE) of the apparatus.

According to the present invention, the installation management system provides the detailed data storage module recording detailed data of the condensing equipment comprising facility. The data is classified in all apparatuses based on one or more predetermined elementary item which is the common. System provides the item-add part it is put through the additional item which desires in order to control apparatuses which can be added to the detailed data storage module to all apparatuses to commonly do. It adds related data to the added item of the apparatuses but data input part are used. The management data cell processing adds data processing detailed data and are stored in the detailed data storage module.

The detailed data storage module is stored in detailed data of condensing equipments forming the apparatus. Detailed data include data of one or more predetermined elementary item which is the common in all apparatuses. It is done by the item basis and it is classified and data is stored. Moreover, system provides the item-add part which is commonly the additive good luck which desires in order to control apparatuses which can be additionally set up in the detailed data storage module at all apparatuses. Supplementary data related to the additional item of the apparatus are inputted through data input part. The management data cell processing processes detail data and supplementary data stored in the detailed data storage module for the administration of facility.

According to the present invention, the installation management system the installation management system respecting the management facility including the condensing equipment comprising facility is provided provides the terminal device and management device. The terminal device provides the thing, which is commonly the management item setting unit set up in the terminal memory part, and the terminal memory part, and the desired item at the apparatus data input part for registering data related to the set management item, and data transmission part transmitting inputted data for each management items. The management device provides data sink, which receives data transmitted from data transmission part of the terminal memory part it is classified in all apparatuses based on one or more basis management item which is the common it implies the memory that detailed data of each apparatus is stored the thing which receives data and management item through the added part receiver is stored in the main memory part, and detailed data stored with the main memory lugs and the management data cell processing processing added data with the added part.

The main memory part of the management device stores detailed data of each apparatus related to the basis management item which is the common in all apparatuses. The individual management item which is the common can be added to apparatuses by the man controlling for example, facility through the terminal device. The added item is transmitted in the management device. The item is set up in the main memory part. Detailed data related to each basis management item and data related to the added management item of the apparatus are processed for the administration of each apparatuses.

According to the present invention, the recording medium which records the facility management program performed by computer in order to control apparatuses comprising facility is provided. Computer the facility management program performs the management item addition sequence. The part the management item addition sequence as to the management item, is the common to the thing (detailed data related to one or more basis management item which is the common in all apparatuses of each apparatuses are stored) that it additionally sets up in the detailed data memory part in apparatuses. Moreover, in order to register supplementary data in which the part of each apparatuses has relation to the management item, computer performs data input sequence as to program. Moreover, according to computer is the facility management program, detailed data stored in the detailed data memory part and the management data processing sequence for processing supplementary data are enforced.

Moreover, the present invention is to provide the recording medium which in order that controls the apparatus for comprising facility, in order that computer enforces the received sequence for receiving data related to the management item which is the common from the terminal device in all apparatuses, is recorded in the facility management program performed by computer. Moreover, received data and the addition sequence for adding the administration underwood are stored in the main memory part of the management device to computer receive sequence. Computer performs in the main memory stepfather according to the facility management program that detailed data of the work apparatus is classified as one or more common items which are the common in each apparatus. And computer stores detailed data of each apparatuses classified based on one or more basis management item which is the common in the apparatus. Moreover, computer adds sequence, in order to enforce the management data processing sequence for processing added data and control the apparatuses of facility, detailed data are stored in the main memory part.

The installation management system the installation management system for managing apparatuses comprising facility according to the property of another is provided of the present invention is equipped with the display unit, the first display controlling element, the symbol selecting part, the second display controlling element having the detailed data memory part, and the display screen. The

detailed data memory part stores detailed data of each apparatuses. It shows the display of facility on the display screen and the symbol according to each apparatus is displayed to the proper location in the first display controlling element on the display of the facility. The symbol selecting part selects the symbol showing up on the display screen. The second display controlling element calls detailed data corresponding to the symbol selected from the detailed data memory part. Called detailed data are displayed on the display screen.

According to this property, the display of the facility which is the same as that of the drawing is indicated on the display screen for example. Symbols which are the same as that of for example, icon are indicated on the facility drawing indicating the apparatus each icon coming under the indicated location on screen on the drawing is positioned in facility, for coming.

The to desire thing among icon is selected through the symbol selecting part. It corresponds to the icon selected from the detailed data memory part and the second display controlling element calls detailed data of the apparatuses. Called detailed data are indicated on the display screen. Therefore, it quicks, the position relation between detailed data of each apparatus in facility and the apparatus are caught on the display screen.

Detailed data of the apparatus provides first judging data indicating thing in which the apparatus normally operates or second judging data which indicates that the apparatus normally does not operate. The first display controlling element the symbol of the apparatus of detailed data including the first or the second judging data public opinion one is expressed in the symbol of the apparatus of detailed data including the rest first or second judging data and the other mode.

Therefore, whether whether each apparatus normally operates or not is not so or not simply can find from their symbols indicated on the display screen.

Moreover, the first display controlling element provides the facility display display unit which is used in order to show the facility display in on display in response to the displaying figure command externally applied to. Moreover, the first display controlling element provides the symbol mark controlling element for indicating symbol in the location wanting with the facility display high position in response to the symbol location command externally applied to on display.

It has this arrangement. it applies to the facility display display controlling element, the desired facility display can draw the displaying figure command in on display at its convenience. Moreover, the location of each symbol on the display screen can control the symbol display controlling element with the means of the symbol location command at its convenience. Therefore, many structure where the different range facility and each apparatuses are differently arranged can be handled this installation management system.

Moreover, the present invention is to provide the readable computer record medium recording the facility management program performed by the computer which has the display it controls the facility including the condensing equipment. Computer performs the first display sequence the facility management program. The symbol selection sequence and the second display sequence are enforced. The first display sequence displays the facility display on the display screen. Moreover, the symbol for one or greater of the apparatus is indicated in the proper location on the facility display on the display screen. The symbol selection sequence selects desired one among the symbol indicated on the display screen out. The second display sequence calls detailed data. The apparatus selected from detailed data is stored in advance. Called detailed data are indicated on the display screen.

Detailed data for each apparatuses provides first judging data indicating the thing in which the apparatus normally operates or second judging data which indicates that the apparatus normally does not operate. The first display adjustment sequence the symbol of the apparatus of detailed data including the first and the second judging data public opinion one is indicated as the symbol of the apparatus of detailed data including the rest first and second judging data and the other mode.

The symbol of the apparatuses operating can be indicated the computer having this recording medium by rest symbols and the other mode. As alternative, the symbol for the trouble devices can be indicated as the other symbols and the other mode.

Moreover, the readable computer record medium provides the facility display display sequence and the first display sequence including the symbol mark sequence. The facility display display sequence indicates the facility display in response to the displaying figure command externally applied to on the display screen. The symbol mark sequence indicates symbol in the desired location on the facility display in response to the symbol location command externally applied to on the display unit.

By applying the displaying figure which is the common to the computer the desired facility display can be drawn on the display screen at its convenience. Moreover, by applying the symbol location which is the common to computer the location of each symbol on the display screen can be controlled at its convenience.

The installation management system according to the property, of another of the present invention provides the thing including the detailed data memory part, data retrieval environment establishment part, data search part, data output stage. The detailed data memory stores detailed data including the indexes for condensing equipments comprising facility. The data retrieval environment establishment part sets up one or more data retrieval environment which searches detailed data in order to evaluate the apparatus with checked out. The data search part searches detailed data of the apparatus for being satisfied one or more data retrieval environment. The data output stage outputs one part of searched detailed data including index at least.

Here, it indicates the used term data output stage to output detailed data to for example, the form of the digital signal to install or output the index including detailed data to the audio format and/or image.

The data retrieval environment establishment part sets up one or the desired data retrieval environment described in the above. Data search part search detailed data when being satisfied one or greater of the establishment environment. And it is indicated on on the screen as for example, digital data or searched detailed data is outputted.



The installation management system provides their indexes data output stage outputs one part of rearranged detailed data at least data rearrangement part for rearranging detailed data searched with data search part is included.

It is rearranged as the order predetermining with for example, data rearrangement part or detailed data searched with data search part are classified. Data which rearranged is searched is outputted to the audio format and/or image or the digital data format.

The present invention is to provide the readable computer record medium recording the facility management program performed by computer it controls the facility including the condensing equipment. The facility management program operates so that computer enforce data retrieval configuration sequence, data retrieval sequence, and data output sequence. The data retrieval configuration sequence sets up one or more data retrieval environment for searching detailed data for the apparatus for the checked out being evaluated. The data retrieval sequence searches detailed data of the apparatus when being satisfied one or greater of data retrieval environments. The data output sequence outputs one part of searched detailed data including the index of that at least.

The computer executive program recorded in this recording medium sets up one or the desired data retrieval environment described in the above. Detailed data are searched and then, when being satisfied establishment environments. It is indicated on screen as for example, the sound or digital data or searched detailed data is outputted.

In order to rearrange searched detailed data, the program recorded on the recording medium performs data rearrangement sequence. The data output sequence outputs one part of rearranged detailed data including their index at least.

Therefore, it is rearranged with detailed data searched with data retrieval sequence as the predetermined order having in data rearrangement sequence. Re-ordering or classified data is outputted to the audio format and/or image or the digital data format.

The present invention is to provide the check on equipment evaluation system which includes the unit check evaluation portion in order to evaluate the condensing equipment comprising facility the checked out according to the checked out evaluation sequence of being predetermined. System more includes the index memory part storing the index for each apparatus. It is rearranged in indices according to the predetermined order. It includes the index calling party calling index and system moreover before anything else one by one calls next indexes in the predetermined order each time when the outside index output instruction corresponds. The index output unit outputs indices called with the index calling party.

Indices stored in the index memory part evaluate apparatuses. The index output unit outputs index to the audio format and/or image for example.

In this system, index is in order before anything else before anything else outputted in arranged indices through the index output unit. When the other index output instruction is externally applied to, the second thing of the indexes is outputted. Thereafter, in each time, the index output instruction corresponds. Next indexes are successfully one by one outputted. It uses to output indices through the index output unit. Operator can determine the order of the apparatuses which the checked out are evaluated.

The check on equipment evaluation system more includes the index output order generator producing the index output instruction in every hour when the checked out evaluation portion completes the checked out evaluation of the apparatus and applies this to the index calling party.

Therefore, the index output from the index output unit is updated to the order that is according to when being finished and predetermines in automatically.

According to the order for the unit check evaluation portion, the , unit check evaluation portion the checked out evaluation sequence for the apparatuses, when each apparatuses are evaluated with checked out, the checked out evaluation of the apparatuses is right. The checked out evaluation system more includes the sequence memory unit, storing a plurality of checked out evaluation sequences for each apparatus the sequence calling party, and the sequence setting unit. When the index for the specific device is called to the sequence calling party with the index calling party, the checked out evaluation sequence for the specific device is called from the sequence memory unit. The sequence setting unit sets up the checked out evaluation sequence of being called in the checked out evaluation portion for the checked out evaluation of the specific device.

It makes the checked out evaluation the order for the unit check evaluation portion straight. The unit check evaluation portion evaluates the specific device the checked out according to the checked out evaluation sequence for the specific device. When one of indices was called with the index calling party, the sequence calling party calls the checked out evaluation sequence for the apparatus for being indicated with the called index from the sequence memory unit. The checked out evaluation sequence of being called is set up by the sequence setting unit in the unit check evaluation portion. Therefore, the checked out evaluation sequence of being matched with the index output from the index output unit is automatically usable the unit check evaluation portion and the proper checked out evaluation can be performed.

According to the present invention, the check on equipment evaluation system provides data sink receiving one part at least of the detailed data output from the installation management system having data output stage. System provides the index storage controlling element storing indices including detailed data received in moreover, the index memory.

The index of each apparatuses searched in the installation management system are applied to the check on equipment evaluation system. It is stored in the index memory part of the check on equipment evaluation system. The indexes of the searched apparatus are outputted in the installation management system from the index output unit of the check on equipment evaluation system.

In the present invention, the , facility can be the piping system. It is evaluated as the trap of the other type and the arranged piping system with checked out or apparatuses can be managed.



## Scope of Claims

### ■ Claim 1:

The check on equipment evaluation system for the checked out test equipment that a plurality of apparatuses is included, said check on equipment evaluation system for the checked out test equipment is comprised of the checked out data processing block in which a plurality of checked out data processing sequences for processing data which is obtained by checking out each thing of the apparatuses forming facility selects one of checked out data processing sequence receiving the sequence store instruction externally applied to the stored main memory part, and auxiliary memory part at least, and is stored in the main memory part according to received one or more sequence store instructions, and processing inspection data which is received in order to evaluate inspected one among the apparatuses with one checked out of being practical among the sequence storage controlling element, storing the selected inspection data processing sequence in the auxiliary memory part and apparatus according to the inspection data processing sequence for one of apparatuses receiving obtained inspection data, and are called with the sequence calling party, and outputting the result of the processing.

### ■ Claim 2:

The check on equipment evaluation system of claim 1, wherein: the check on equipment evaluation system includes the sequence call instruction, and the sequence calling party including the auxiliary memory part, the sequence storage controlling element generating the inspection data processing sequence corresponding to one or more sequence store instruction stored in the save area of the auxiliary memory part for the type of the apparatus, and the combination of the type selection command for selecting one of the sequence select instruction and the device type including the apparatuses of a plurality of different the types, and a plurality of save areas for the other type of the apparatuses; the sequence storage controlling element generating the inspection data processing sequence corresponding to one or more sequence store instruction stored in the save area of the auxiliary memory part for the type of the apparatus inspected is evaluated according to the inspection data processing sequence; and the combination of the type selection command for selecting one of the sequence select instruction and the device type desires in order to select desired one of data processing sequence out out. The sequence calling party selects one of the save area corresponding to the type selected according to the type selection command out; and calls one of the inspection data processing sequence stored in the selected save area corresponding to the sequence select instruction.

### ■ Claim 3:

The check on equipment evaluation system comprising: the checked out evaluation below \*\*\* unit check evaluation portion the apparatus according to the sequence selecting unit, selecting one of checked out evaluation sequence of the trap in response to the sequence memory unit, storing the trap checked out evaluation sequence of being performed in the check on equipment evaluation system for evaluating the facility included the checked out it evaluates the trap which is in the piping system with checked out and the valve checked out evaluation sequence of being used the valve checked out evaluation sequence evaluate the valve having in the piping system and the sequence select instruction externally applied to corresponding to the apparatus for the checked out being evaluated and valve a plurality of apparatuses including one or more traps and one or more valves and the checked out evaluation sequence of being selected by the sequence selecting unit.

### ■ Claim 4:

The checked out and evaluation of the apparatuses the trap checked out evaluation sequence of being used in order to evaluate one or more traps which are in the piping system in the check on equipment evaluation system for evaluating the facility including a plurality of apparatuses including one or more traps and one or more valves the checked out with checked out and one or more valves which is in the piping system one of checked out evaluation sequence of the trap in response to the sequence memory unit, storing the valve checked out evaluation sequence of being performed it evaluates the checked out and the sequence select instruction externally applied to corresponding to the apparatus for the checked out being evaluated and valves are marked in one of first and the second checked out evaluation mode having with the sequence selecting unit, selected and the first and the second checked out evaluation mode, and is selected in response to the mode preferences command externally applied toes. The check on equipment evaluation system comprising: the thing, evaluating the apparatus according to the checked out evaluation sequence of being selected by the unit check evaluation portion, and the sequence selecting unit in the first mode than with checked out the thing, performing the trap checked out evaluation or the valve checked out evaluation in the second mode to the times predetermining according to the unit check evaluation portion, and one of the checked out of being selected the evaluation sequence of being selected by the sequence selecting unit, and the times which is identical according to the other checked out evaluation sequence and predetermines the valve checked out evaluation or the thing performing the trap checked out evaluation.

### ■ Claim 5:

The vibration pickup part providing vibration sign data which indicates the detected vibration it detects vibration, and the detection data processing block processing vibration sign data receiving vibration sign data from the vibration pickup part and it becomes the checked out evaluation sequence with present progressive, follows and is received of claim 3 or 4, wherein it is generated in the apparatus

The check on equipment evaluation system comprising: the trap checked out evaluation sequence, in which the detection data processing block calculates the fluid leakage amount through one or more traps interval with the oscillation amplitude of the fluid leakage amount controlled by one or more traps and one or more traps which is generated one or more traps are according to due to the fluid leakage with that vibration sign data is processed according to the stored correlation and the valve checked out evaluation sequence in which the detection data processing block calculates the size of the vibration having in one or more valves from vibration sign data.

### ■ Claim 6:

The detection data processing block processing data of claim 3 or 4, wherein the vibration pickup part, providing vibration sign data which indicates the detected vibration it detects the vibration generated in the apparatus the temperature detection station providing temperature display data indicating the temperature measuring the temperature of the apparatus and is detected, and vibration sign data and present use temperature display data is received are received according to one of evaluation sequences

The check on equipment evaluation system wherein the detection data processing block includes vibration sign data according to the correlation which is interval with the size of the vibration of the fluid leakage amount controlled by one or more traps and one or more traps generated with the fluid leakage amount at one or more traps and temperature stored and the trap checked out evaluation sequence, which according to this, calculates the fluid leakage amount through one or more trap process temperature display data and the valve checked out evaluation sequence in which the detection data processing block calculates the size of the vibration having in one or more valves from vibration sign data.

■ Claim 7:

The installation management system which includes the classifier for classifying into the predetermined type number of the obtained evaluation results, and the analysis section analyzing classified evaluation results by evaluating each of a plurality of apparatuses comprising facility with the multi step the checked out of the installation management system comprising the first and the second step.

■ Claim 8:

The readable recording medium in which the facility management program which is performed it respects the thing which operates computer it performs the analysis sequence of analyzing evaluation results according to the sequence which is classified it performs the classification sequence for classifying evaluation results which are obtained it evaluates each apparatuses forming facility into a plurality of steps including the first and the second step with checked out it is classified is recorded.

■ Claim 9:

The installation management system of the installation management system comprising the management data cell processing which detailed data of a plurality of apparatuses forming facility is stored; and processes the detailed data storage module, in which data is classified in all apparatuses based on one or more predetermined items which are the common and data input part, for respecting apparatuses and adding data related to the added item of the item-add part, which can be added through the desired additional item which is the common in all apparatuses in the detailed data storage module and apparatus and detailed data and added data which is stored in the detailed data storage module.

■ Claim 10:

The data transmission part which sets up the terminal device, and the management item setting unit; and transmits the desired management item, which is the common data input part for inputting data relating to the thing setting up the management item, and data coming in for each management item from the terminal memory part in the apparatus of the installation management system for controlling the facility including a plurality of apparatuses comprising facility comprising the terminal memory part

The installation management system wherein the management device includes the added part in which the management item which is received in all apparatuses with the main memory, classified based on one or more basic management items which are the common data sink receiving data transmitted from data transmission part of the terminal device, and data and receiver detailed data of each apparatus is stored is additionally stored through the added part in the main memory part, and the management data cell processing processing added and added data and detailed data stored in the main memory part with the added part.

■ Claim 11:

The readable computer record medium recording the facility management program of the readable computer record medium recording the facility management program performed by computer it controls apparatuses forming facility, wherein computer enforces detailed data of the apparatus for being stored in all apparatuses based on one or more basic management items which are the common or being classified, and the management item addition sequence, which respects that the additional management item which is the common is set up in apparatuses in the detailed data memory part and data input sequence, for inputting additive data which relate to additionally-set up the management item of each apparatuses and detailed data stored in the detailed data memory and the management data processing sequence for processing supplementary data.

■ Claim 12:

The readable computer record medium recording the facility management program performed by computer it controls apparatuses that forms facility, wherein the received sequence, respecting the thing receiving data of the management item which is the common in the apparatus transmitted from the terminal device and the addition sequence for adding data received in the received sequence are stored in the main memory part in which detailed data of each apparatus for being classified as one or more management items which are the common is stored in each apparatus with the management item which is the common in each apparatus; and it records the facility management program in which computer enforces the management data processing sequence for processing data added in the administration sequence and detailed data stored in the main memory.

■ Claim 13:

The installation management system for controlling apparatuses that forms facility, said installation management system for controlling apparatuses is comprised of the first display controlling element, in which moreover, one or more symbols according to each apparatuses is indicated on the location having on the display of facility on the display screen it shows the display of the detailed

data memory part, storing detailed data of each apparatus and the display unit, having the display screen and facility on the display screen and the second display controlling element which calls detailed data corresponding to the symbol selected with the symbol selecting part selecting desired one among the symbol indicated on the display screen from the detailed data memory part and in which called detailed data are indicated on the display screen.

■ Claim 14:

The installation management system of claim 13, wherein detailed data of the apparatus includes first judging data which indicates that the apparatus normally operates as to the installation management system and the second judging data public opinion one which indicates that the apparatus abnormally operates; and the first display controlling element the symbol of the apparatus for detailed data including one of the first and second judging data is indicated as the symbol of the apparatus for detailed data including the rest one of the first and second judging data and the other mode.

■ Claim 15:

The installation management system of claim 13, wherein the first display controlling element as to the installation management system includes the facility expression display tab hanging part showing the facility display in response to the displaying figure command externally applied to on the display screen; and it includes the symbol mark controlling element expressing symbol on the facility display in the desired location in response to the symbol location command externally applied to on the display screen.

■ Claim 16:

The readable computer record medium of the readable computer record medium recording the facility management program performed by the computer including the display unit which has the display screen it manages the condensing equipment comprising facility, wherein detailed data of the apparatus for coming under the outward selected symbol of the first display sequence, for showing the display of facility on the display screen and indicating the symbol for one or more apparatuses in the proper location of the facility display on the display screen and the symbol selection means, for selecting desired one among the symbol indicated on the display screen out and detailed data stored in advance is called and the facility management program in which computer enforces the second display sequence for indicating called detailed data on the display screen is recorded.

■ Claim 17:

The readable computer record medium of claim 16, wherein detailed data of the apparatus as to the readable computer record medium includes first judging data which indicates that the apparatus normally operates and second judging data which indicates that the apparatus abnormally operates; and the first display controlling element generates that the symbol of the apparatus for detailed data including the first and the second judging data public opinion one is indicated as the symbol of the apparatus for detailed data including the rest of the first and second judging data and the other mode.

■ Claim 18:

The readable computer record medium of claim 16, wherein the first display sequence as to the readable computer record medium includes the facility display expression sequence for expressing the facility display in response to the displaying figure command externally applied to on the display screen and the symbol mark sequence expressing symbol in response to the symbol location command externally applied to on the display screen in the desired location of the facility display.

■ Claim 19:

The installation management system including data output stage outputting one part including the detailed data memory part, data searching condition configuration part for setting up one or more data retrieval conditions for searching detailed data for the apparatus for the checked out being evaluated, data search part, and the index of searched detailed data of the installation management system, wherein detailed data detailed data for the condensing equipment forming facility is stored are comprised of the index for each apparatuses, and data search part searches that detailed data of the apparatus satisfies one or more data retrieval conditions.

■ Claim 20:

The installation management system of claim 19, further comprising data output stage outputting the part including index at least of detailed data rearranged with data rearrangement part for rearranging detailed data searched with data search part.

■ Claim 21:

The readable computer record medium recording the facility management program in which computer enforces data search requirement sequence, respecting the thing which sets up one or more search criteria advises it searches detailed data for the apparatus for the checked out being evaluated as to the readable computer record medium recording the facility management program performed by computer for the administration of the condensing equipment forming facility and data retrieval sequence, for searching the thing in which detailed data of the apparatus meets one or more data retrieval conditions and data output sequence respecting the thing outputting one part including index at least of searched detailed data.

■ Claim 22:

The readable computer record medium of claim 21, wherein it has the facility management program in which computer more enforces data rearrangement sequence, for rearranging searched detailed data which are in data retrieval sequence and the rearranged detailed data, at least, data power sequence outputting one part including index.

**■ Claim 23:**

The check on equipment evaluation system which respects to evaluate the condensing equipment forming facility the checked out according to the checked out evaluation sequence and includes the unit check evaluation portion that is predetermined, said check on equipment evaluation system which respects to evaluate the condensing equipment forming facility the checked out according to the checked out evaluation sequence and includes the unit check evaluation portion are comprised of the index output unit outputting the index calling party, which calls and the index called with the index calling party in each point of time when the outside index output instruction is one by one following indexes applied to the order calling the index memory part, which rearranges the indexes for each apparatuses to the predetermined order and which stores and the index having to the first on the provisional planting and is predetermined.

**■ Claim 24:**

The checked out evaluation system of claim 23, wherein in the point of time when the checked out evaluation portion completes the checked out evaluation of the apparatuses, it includes to produce and apply the index output instruction to the index calling party.

**■ Claim 25:**

The check on equipment evaluation system of claim 23, wherein: according to the unit check evaluation portion the unit check evaluation portion is the checked out evaluation sequence for each apparatus each apparatuses, the sequence memory unit, the sequence calling party, and the sequence setting unit for setting up the checked out evaluation sequence of being called of being in the checked out evaluation portion used for the checked out evaluation of the specific device are included when evaluating the checked out; the sequence memory unit has with the check on equipment evaluation system; and makes the checked out evaluation of the apparatus exact stores a plurality of gum evaluation sequences for each apparatuses; and the sequence calling party the index for the specific device was called from the sequence memory unit with the index calling party with the checked out evaluation sequence for the specific device; and is called.

**■ Claim 26:**

The check on equipment evaluation system of claim 23, further comprising the index storage controlling element storing data sink receiving one part at least of detailed data outputted from the installation management system defined with claim 19 and the index included in received detailed data in the index memory part.

**■ Claim 27:**

As to claim 23, the Lee system staying with facility more includes the index storage controlling element storing data sink receiving a portion at least of detailed data outputted from the computer performing the recorded facility management program having in the recording medium defined with claim 21 and the index included in received detailed data in the index memory part.

**■ Claim 28:**

The check on equipment evaluation system of claim 1 or 23, wherein it is the trap of the other type in which facility is the piping system and apparatuses are located in the piping system.

**■ Claim 29:**

The installation management system of one claim among claim 7, claim 9, claim 10, claim 13, claim 19, wherein it is the different trap in which facility is the piping system and apparatuses are positioned in the piping system.

**■ Claim 30:**

The readable computer record medium which it is done by the feature which is the different trap in which apparatuses are positioned in the piping system facility is the piping system as to one claim of claim 8, claim 11, claim 12, claim 16, claim 21.

**■ Claim 31:**

The check on equipment evaluation method for the checked out evaluation that includes the apparatus of each plurality, said check on equipment evaluation method for the checked out evaluation is comprised of the processing, which obtained data are stored each one is according to it checks out each one of the apparatuses and the thing, receiving one or greater of the sequence store instruction externally applied to the thing, selecting inspection data the thing, storing selected inspection data in the auxiliary memory and the thing receiving the sequence call instruction externally applied to corresponding to one of the apparatus, and the thing, selecting inspection data stored in the auxiliary memory part corresponding to the received sequence call instruction and the thing processing inspection data which is received in order to evaluate one inspected apparatus according to inspection data for the apparatus for being called with the sequence call instruction, and outputs the result of the processing.

**■ Claim 32:**

The check on equipment way to evaluate of claim 31, wherein the facility forming the apparatus consists of a plurality of different types; the auxiliary memory includes the plurality save area for the type of each apparatus; it causes that one or more sequence store instructions are stored for the type of the apparatuses which the checked out are evaluated according to inspection data in the auxiliary memory; one desiring among the type of the apparatuses is selected out; the desired inspection data processing sequence

is selected; the save area corresponding to the selected type is selected; and inspection data stored in the selected save area corresponding to the sequence select instruction is called.

■ Claim 33:

The check on equipment way to evaluate for the checked out evaluation including the condensing equipment that includes the trap and valve, said check on equipment way to evaluate for the checked out evaluation including the condensing equipment are comprised of the thing selecting one of checked out evaluation sequence of the trap in response to the sequence select instruction which corresponds to the apparatus for the checked out being evaluated it stores the valve checked out evaluation sequence in the sequence memory unit it evaluates valve having in the piping system the checked out it stores the trap checked out evaluation sequence in the sequence memory unit it evaluates the trap which is in the piping system with checked out and is externally applied to and valve, and evaluates the apparatus according to the checked out evaluation sequence of being selected by the sequence selecting unit with checked out.

■ Claim 34:

The trap checked out evaluation sequence of being used in order to evaluate one or more traps which are in the piping system the checked out as to the check on equipment way to evaluate for the checked out evaluation including the condensing equipment including one or more traps and one or more valves is stored. One of trap in response to the sequence select instruction which corresponds to the apparatus for the checked out being evaluated it stores the valve checked out evaluation sequence of being used it evaluates the checked out and is externally applied to and valve checked out evaluation sequence two are followed to select one of evaluation sequence in the second mode the checked out evaluation of the apparatus according to the checked out evaluation sequence is selected in the first mode with the sequence selecting unit the checked out evaluation of the apparatus is marked as one of first and the second checked out evaluation mode selecting, and is selected in response to the mode preferences command externally applied to and it is one or more valves which are in the piping system selected with the sequence selecting unit to check the number predetermining of the trap or valve out and evaluate. The check on equipment way to evaluate comprising: the thing which and then, evaluates the same number predetermining of the trap or valve according to the other evaluation sequence with checked out.

■ Claim 35:

The check on equipment way to evaluate of claim 33, further comprising the thing which detects the vibration generated in the apparatus; it provides vibration sign data indicating the detected vibration; it receives vibration sign data; it processes received vibration sign data; it processes vibration sign data according to the stored correlation between one or more oscillation amplitudes which is according to due to the fluid leakage and is caused and the fluid leakage amount controlled by one or more traps; the correlation calculates the fluid leakage amount through one or more traps with that; and calculates the size of the vibration in one or more valves from vibration sign data.

■ Claim 36:

The check on equipment way to evaluate of claim 33, further comprising vibration sign data and the thing which receives temperature display data; it processes received data; it processes according to the stored correlation between the oscillation amplitude of one or more traps caused by the fluid leakage amount, which is vibration and temperature display data controlled with one or more traps the fluid leakage and temperature of one or more traps; it calculates the fluid leakage amount through the trap of one executive director with the thing; and calculates the size of the vibration having in one or more valves from vibration sign data. Temperature display data which indicates the detected temperature it detects the temperature of the apparatus is provided vibration sign data indicating the detected vibration is provided the vibration generated in the apparatus is detected.

■ Claim 37:

The facility management mode which classifies into a plurality of steps; and includes to analyze the classified evaluation result of the facility management mode comprising the first and the second step the number predetermining of the type of the evaluation result which is obtained it evaluates each of the condensing equipment for forming facility the checked out.

■ Claim 38:

The facility management mode wherein the classification sequence is performed in order to classify the evaluation result which is obtained by evaluating each apparatuses forming facility with checked out into the multi step including the first and the second step; and with being classified according to the classification sequence the evaluation result is analyzed.

■ Claim 39:

The facility management mode of the facility management mode comprising the thing which stores detailed data of the condensing equipment for forming facility; it classifies data in all apparatuses based on one or more predetermined and basic items which are the common; it adds the desired additional item which is the common in all apparatuses to the detailed data storage module in order to control apparatuses; detailed data adds data related to the additional item of the apparatus; and processes data added with detailed data stored in the detailed data storage module.

■ Claim 40:

The facility management mode for controlling the facility including the condensing equipment that forms facility, said facility management mode for controlling the facility including the condensing equipment is comprised of data which is added data corresponding to the management item received with receiver are stored it receives data transmitted from data former brush part of the



terminal memory part inputted data stores detailed data of each apparatus in all apparatuses based on one or more management items which are the common. It transmits data for each management item. It inputs data related to the set up management item. It sets up the desired management item which is the common in the apparatus and the thing processing detailed data.

■ Claim 41:

The facility management mode which is used in order to control the apparatus that forms facility, said facility management mode which is used in order to control the apparatus is comprised of the thing which sets detailed data which are classified and stored based on one or more basic management items which are the common in all apparatuses and are classified to the detailed data memory part, and inputting additive data which relate to additionally set up the management item of each apparatuses, and in which the stored detailed data unit having in the detailed data memory part processes data.

■ Claim 42:

The facility management mode wherein the facility management mode which is used in order to control the apparatus for forming facility includes the thing which receives data of the management item which is the common in the apparatus transmitted from the terminal device; data received with the common management item are added to the main memory part in which detailed data about each apparatus classified as one or more basic management items which are the common is stored in each apparatus; and processes data added in the thing adding sequence and detailed data stored in the main memory part.

■ Claim 43:

Detailed data of each apparatuses is stored and the display of facility is indicated as to the facility management mode for controlling the apparatus for forming facility on the display screen. One or more symbols corresponding to moreover, each apparatus selects desired one among the symbols displayed on the display screen. It is indicated on location on the display of facility on the display screen out. Detailed data corresponding to the selected symbol are called. Called detailed data are indicated on the display screen.

■ Claim 44:

The facility management mode of claim 43, wherein the symbol of the apparatus of detailed data including one of first and second judging data detailed data of the apparatus includes first judging data which indicates the apparatus normally operates thing and second judging data which shows the apparatus abnormally operates thing is indicated as the symbol of the apparatus of detailed data including the rest of the first and second judging data and the other mode.

■ Claim 45:

The facility management mode of claim 43, wherein the facility display is shown in response to the displaying figure command externally applied to on the display screen; and it includes the desired location on the facility display in response to the symbol location command externally applied to on the display screen to show symbol.

■ Claim 46:

The facility management mode showing the display of facility in the facility management mode for controlling the facility including the condensing equipment on the display screen and indicates the symbol for one or more apparatuses in the proper location on moreover, the display screen on the facility display, and selects desired one among the symbol indicated on the display screen out, and calls detailed data of the selected apparatus for being outward stored in advance of detailed data, and includes to indicate called detailed data on the display screen.

■ Claim 47:

The facility management mode of claim 46, wherein detailed data of the apparatus includes one of first judging data which indicates that the apparatus normally operates; one includes second judging data which indicates that the operation of the apparatus is abnormal; and the apparatus symbol of detailed data including one of the first and second judging data is indicated as the symbol of the apparatus of detailed data including the rest of the first and second judging data and the other mode.

■ Claim 48:

The facility management mode of claim 46, wherein the facility display is shown in response to the displaying figure command externally applied to on the display screen; and symbol is indicated in the desired location in response to the symbol location command externally applied to on the display screen on the facility display.

■ Claim 49:

The facility management method of the facility management mode, wherein detailed data detailed data for the condensing equipment forming facility is stored is comprised of the thing outputting index a portion to the part having at least of detailed data which is searched. It searches the thing in which detailed data of the apparatus meets one or more conditional search conditions. It sets up one or more data retrieval conditions for searching detailed data for the apparatus which the checked out is evaluated. It includes the indexes for each apparatus.

■ Claim 50:

The facility management mode of claim 49, wherein detailed data searched with data search part are rearranged; and it includes to output rearranged detailed data including index at least.

■ Claim 51:

The facility management mode which includes to output one part at least of the facility management mode for controlling the facility including the condensing equipment comprising index detailed data which sets up one or more search conditions for searching detailed data for the apparatus for the checked out being evaluated; detailed data of the apparatus searches that one or more data retrieval conditions meet; and is searched.

■ Claim 52:

The facility management mode of claim 51, wherein detailed data searched in data retrieval sequence are rearranged; and the to output one part at least. Thing of rearranged detailed data including index is included.

■ Claim 53:

The check on equipment way to evaluate for evaluating a plurality of apparatuses the checked out that forms facility, said check on equipment way to evaluate for evaluating a plurality of apparatuses the checked out is comprised of the thing storing the index for each apparatus, and arranges index to the predetermined order, and calls the index having to the first in turn, and one by one calls the next index in every hour when the outside index output instruction corresponds to the predetermined order, and outputs called indices.

■ Claim 54:

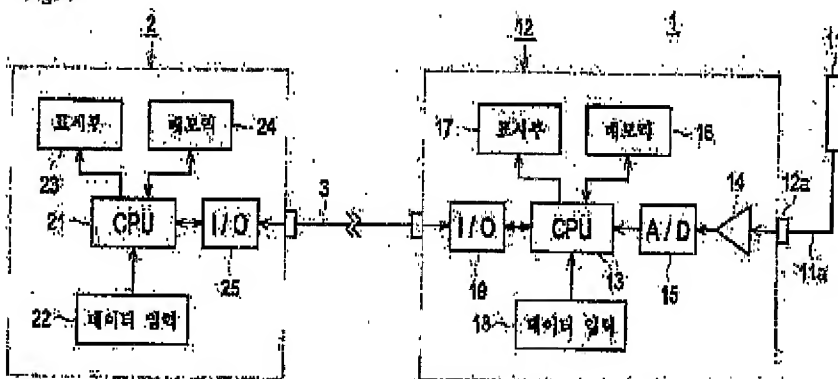
The check on equipment way to evaluate of claim 53, wherein the check on equipment way to evaluate is further comprised of the thing which evaluation produces the output index when closing or applies the checked out and evaluation of the checked out evaluation additional hardware.

■ Claim 55:

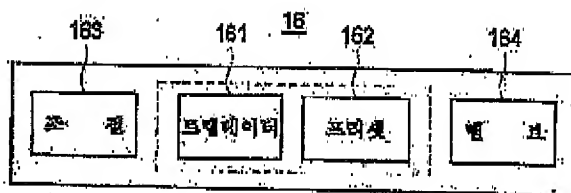
The check on equipment way to evaluate of claim 53, wherein a plurality of checked out evaluation sequences was stored for each apparatuses; the index for the specific device was called; the checked out evaluation sequence for the specific device is called; and it includes to set the checked out evaluation sequence of being called for the checked out evaluation of the specific device to the checked out evaluation portion.

## Drawing

■ Fig. 1



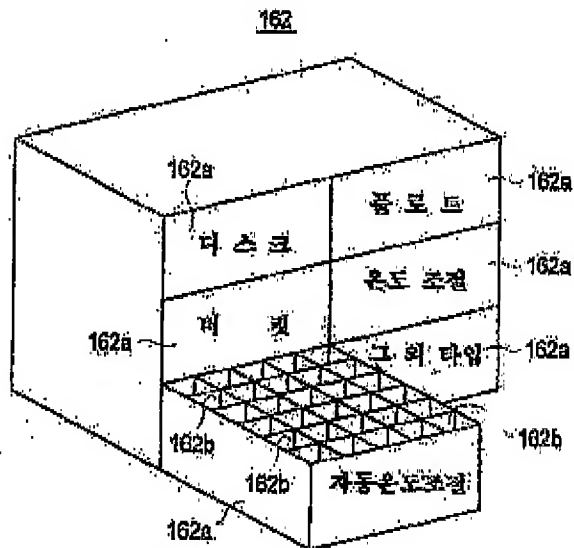
■ Fig. 2



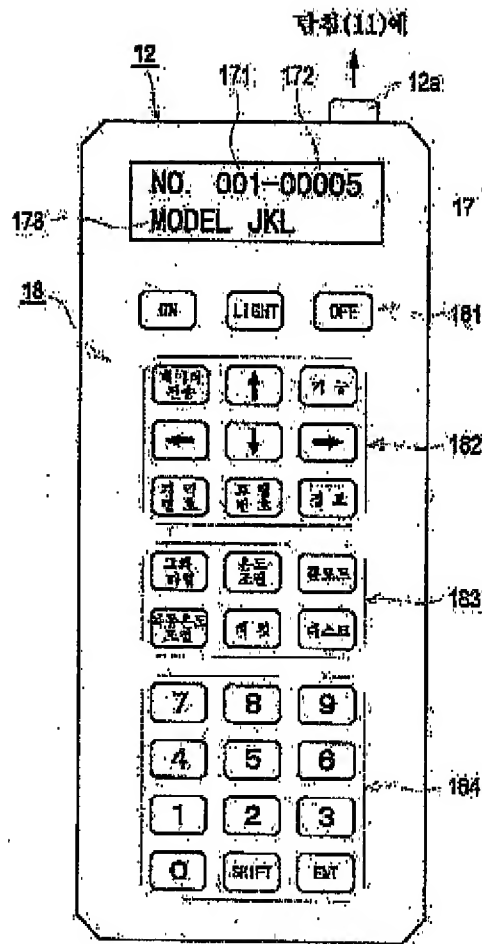
■ Fig. 3

등록 번호	모델	제조사	모델 타입	프로세싱 데이터(D)
0001	AAA	PQR	디스크	D1
0002	BBB	PQR	하드	D2
0003	CCC	STU	디스크	D3
0004	DDD	STU	플로트	D4
0005	EEE	XYZ	플로트	D5

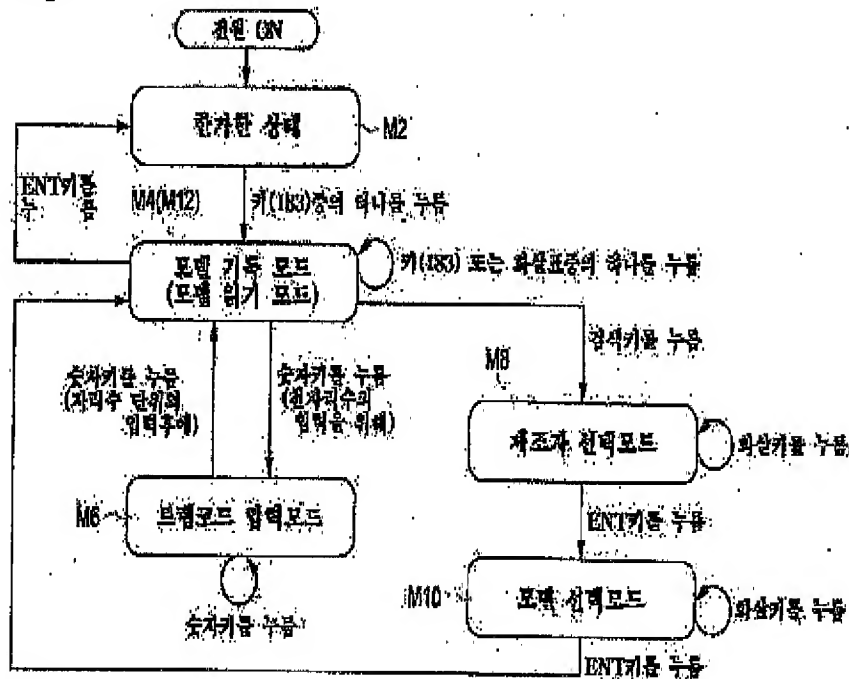
■ Fig. 4



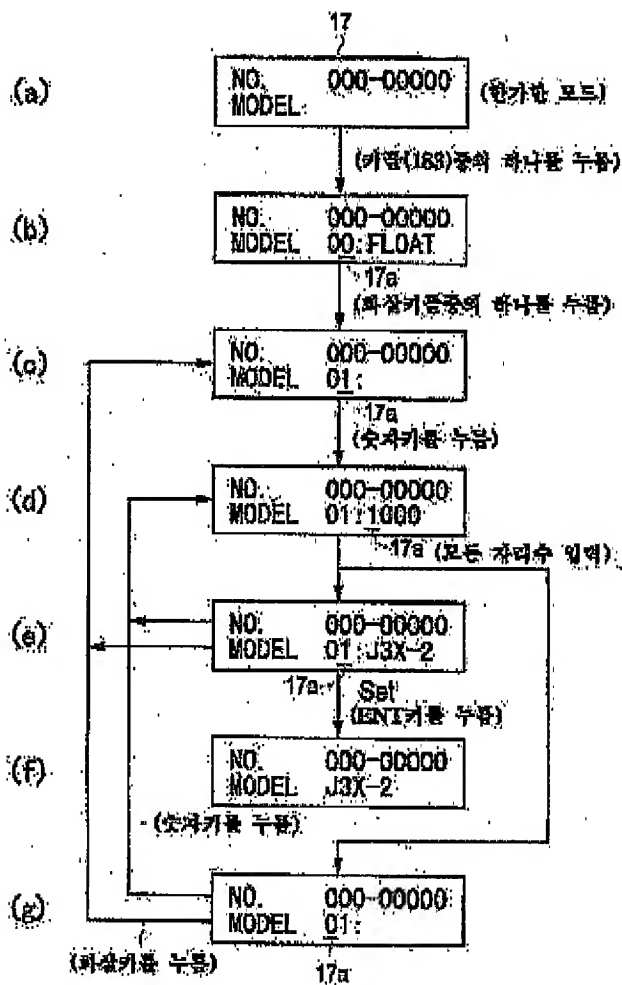
■ Fig. 5



■ Fig. 6

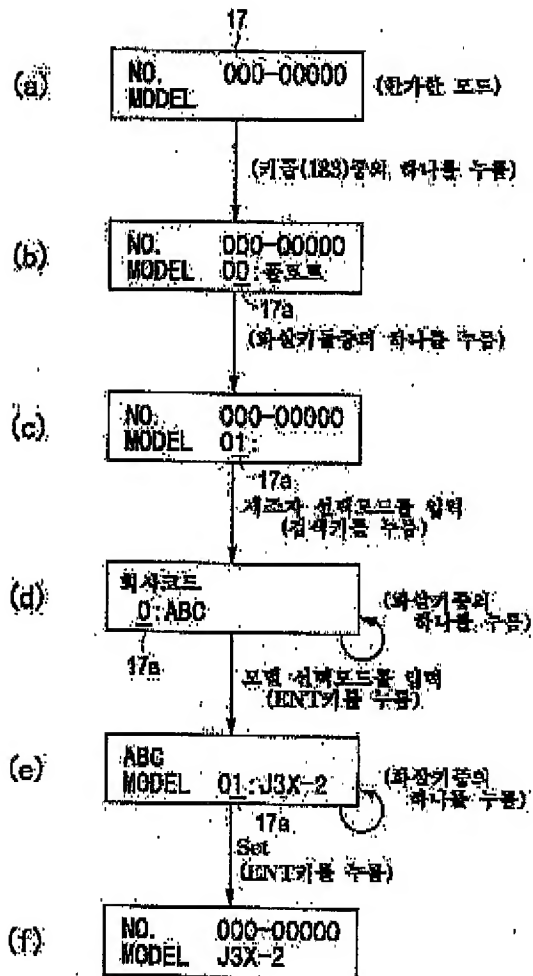


■ Fig. 7

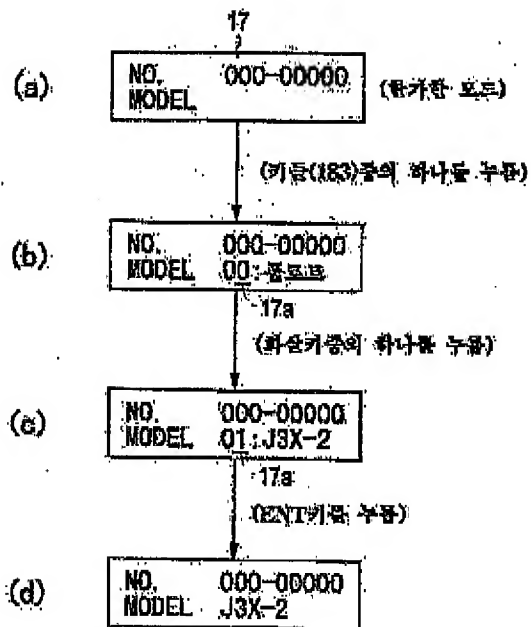


■ Fig. 8

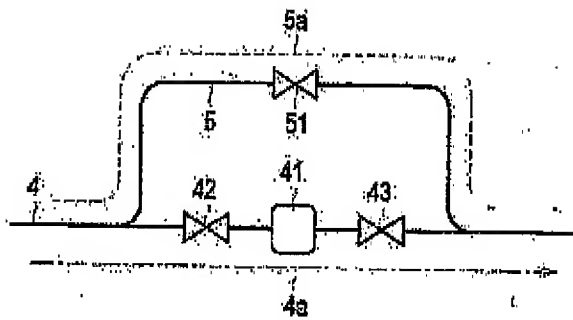




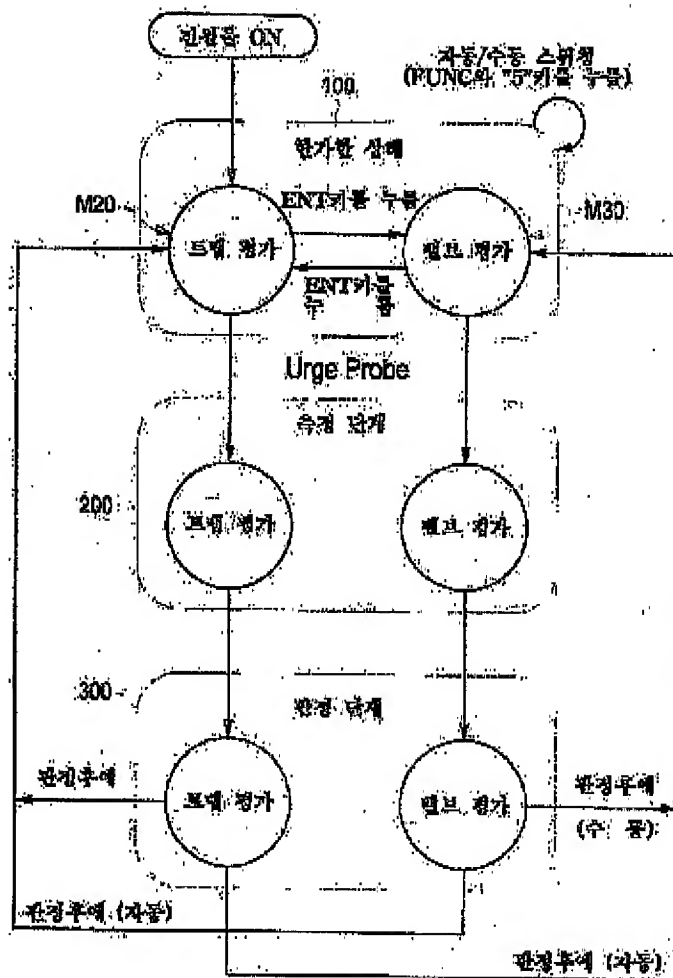
■ Fig. 9



■ Fig. 10



■ Fig. 11



■ Fig. 12

데이터 형	형 식	크 기
STX	16진수 코드	1byte
지역 번호	10진수	3bytes
트렌 번호	10진수	5bytes
트렌 모델	10진수	4bytes
트렌 타입	10진수	1byte
검색 데이터	10진수	8bytes
광 경	10진수	2bytes
이동력제이션	10진수	2bytes
작을 알리	10진수	3bytes
우선순위	10진수	2bytes
다음과 현재 데이터	10진수	3bytes
합을 체크	16진수	4bytes
ETB	16진수 코드	1byte
CR	16진수 코드	1byte

■ Fig. 13

지역	트렌	모델	트렌 타입	출력 날짜	형 식	이동력제이션	광 경	우선순위
001	00001	ABC	버킷	07/18/1997	광 경	가 열	0-50	중요한
001	00002	CDE	자동차조절	07/18/1997	광 경	가 열	0-50	중요한
001	00003	EFG	온도조절	07/18/1997	누출/누출	가 열	0-50	중요한
001	00004	GHI	온도조절	07/18/1997	광 경	가 열	0-50	중요한
001	00005	JKL	플로터	08/30/1997	조절 실패	가 열	0-50	중요한
001	00006	GHI	온도조절	08/30/1997	정지/정지	가 열	0-50	중요한
001	00007	EFG	온도조절	08/30/1997	누출/누출	가 열	0-50	일반적인
001	00008	CDE	자동차조절	08/30/1997	광 경	가 열	0-50	일반적인
001	00009	CDE	자동차조절	01/18/1997	누출/누출	가 열	0-50	일반적인
001	00010	GHI	온도조절	01/18/1997	광 경	가 열	0-50	일반적인
001	00011	CDE	자동차조절	01/18/1997	광 경	가 열	0-50	일반적인
001	00012	LMN	디스크	01/18/1997	광 경	정지됨	50-150	중요한

■ Fig. 14

23

목적지 입력이 완료

수출

수출/수입

수출/수입/수출

수출/수입/수출/수입

수출/수입/수출/수입/수출

수출/수입/수출/수입/수출/수입

현재위치 입력이 완료

미사

수출/수입/수출/수입/수출/수입

수출/수입/수출/수입/수출/수입/수출/수입

OK

다음

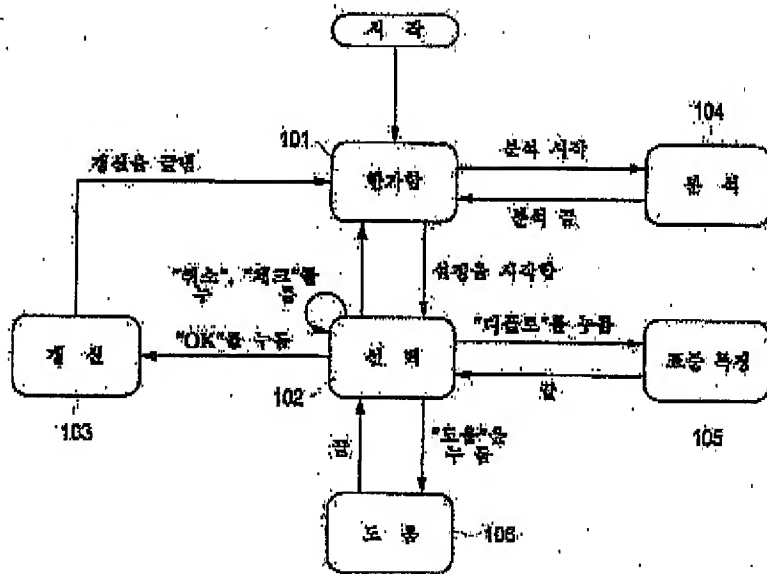
종료

■ Fig. 15

지번	종류	소재	소재	브랜드 타입	설치 일자	이동리더이성	일 령	손 결
001	교광	00005	JKL	플로트	08/30/1997	가 열	0-50	0.00
		00007	EEG	자음온도조절	08/30/1997	가 열	0-50	4.00
	미결정	00008	GHI	자음온도조절	08/30/1997	가 열	0-50	0.00
	양도	00001	ABC	리프트	07/18/1997	가 열	0-50	0.00
		00002	CDE	온도조절	07/18/1997	가 열	0-50	0.00
		00003	EFG	자음온도조절	07/18/1997	가 열	0-50	2.00
		00004	GHI	자음온도조절	07/18/1997	가 열	0-50	0.00
		00006	CDE	온도조절	08/30/1997	가 열	0-50	0.00
		00009	CDE	온도조절	01/18/1997	가 열	0-50	T.00
		00010	GHI	자음온도조절	01/18/1997	가 열	0-50	0.00
		00011	CDE	온도조절	01/18/1997	가 열	0-50	0.00
		00012	LMN	디스크	01/18/1997	데이터	50-150	0.00

■ Fig. 18





■ Fig. 17

23

번호	이름	성명
0	PPP	XXX-1
1	GGG	XXX-2
2	RRR	XXX-3
3	SSS	YYY-1
4	TTT	YYY-2
5	UUU	YYY-3

23a

(a)

23

번호: 5

이름: UUU

성명: YYY-3

OK

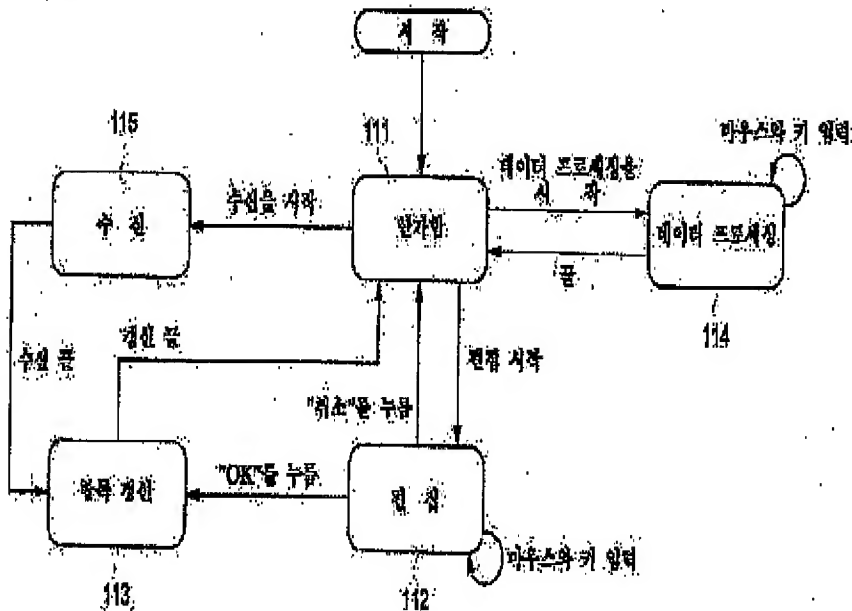
취소

(b)

■ Fig. 18

지 역	구 분	구 분	프로세싱 데이터	제 조 자	부 품 명	사용자-1	기 타
001	00001	ABC	D11	PQR	0-12	PPP	*****
001	00002	GDE	D12	XYZ	0-12	PPP	*****
001	00003	EFG	D13	XYZ	0-12	PPP	*****
001	00004	GHI	D14	PQR	0-12	PPP	
001	00005	JKL	D15	PQR	0-12	PPP	*****
001	00006	GHI	D14	PQR	0-12	PPP	
001	00007	EFG	D13	XYZ	12-24	QQQ	
001	00008	GDE	D12	XYZ	12-24	QQQ	
001	00009	GDE	D12	XYZ	12-24	QQQ	*****
001	00010	GHI	D14	PQR	12-24	SSS	*****
001	00011	GDE	D12	XYZ	12-24	SSS	
001	00012	LMN	D11	PQR	0-12	UUU	*****

■ Fig. 19



■ Fig. 20

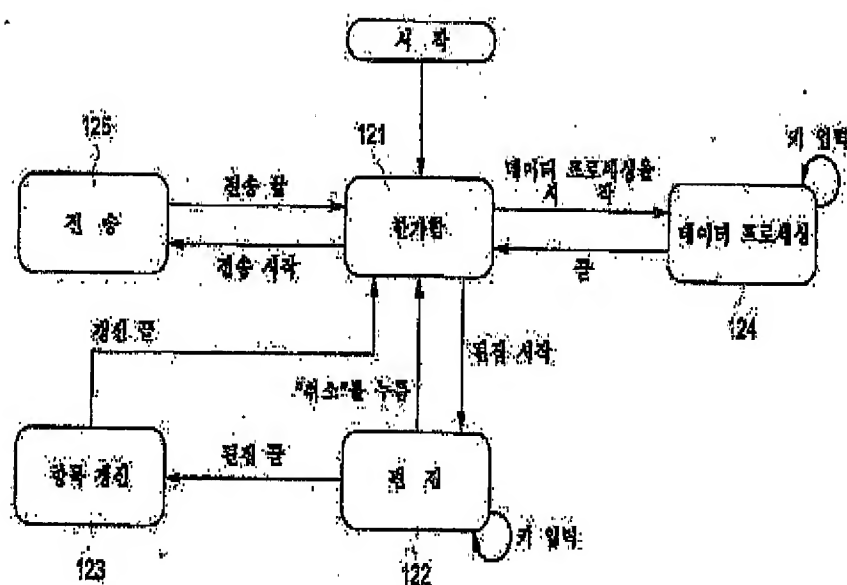


Fig. 21

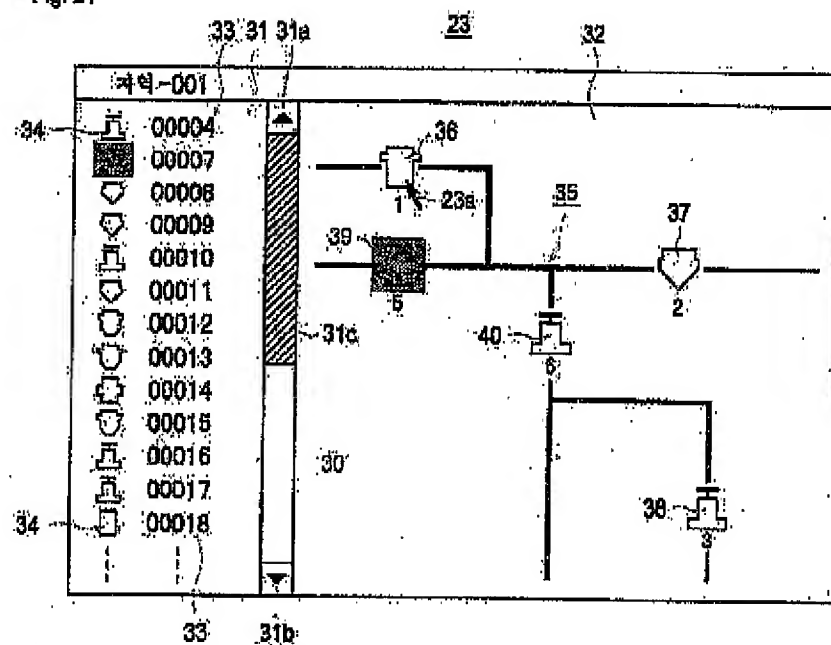
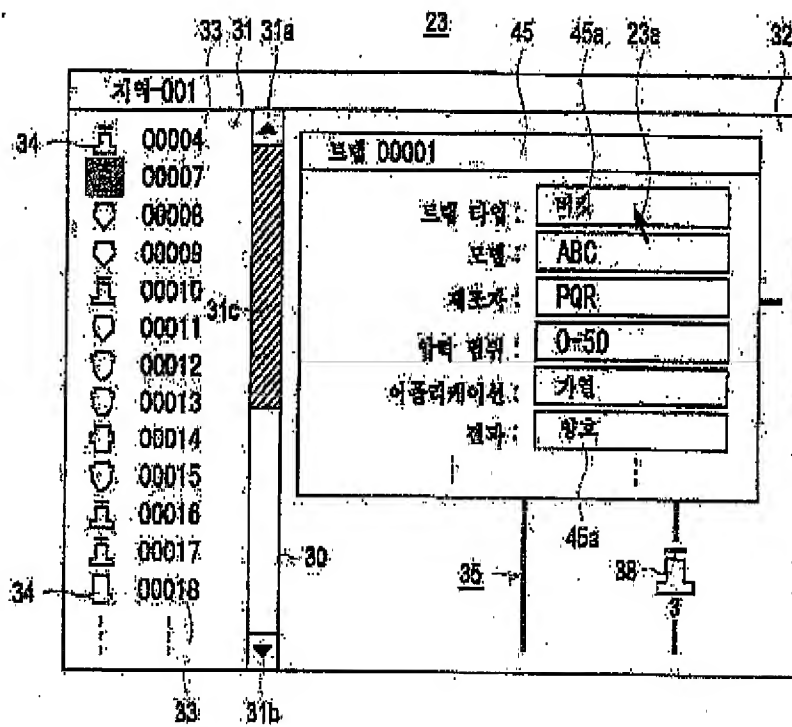
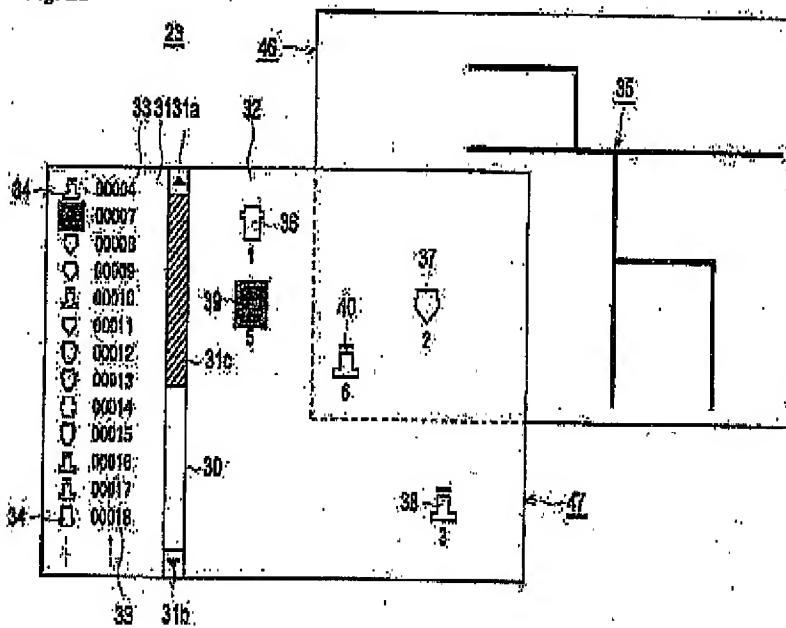


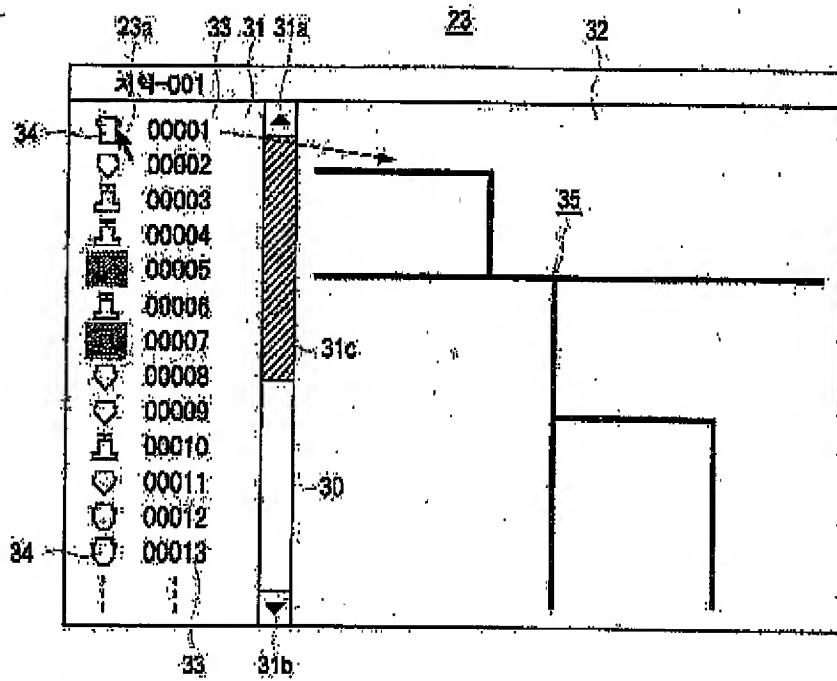
Fig. 22



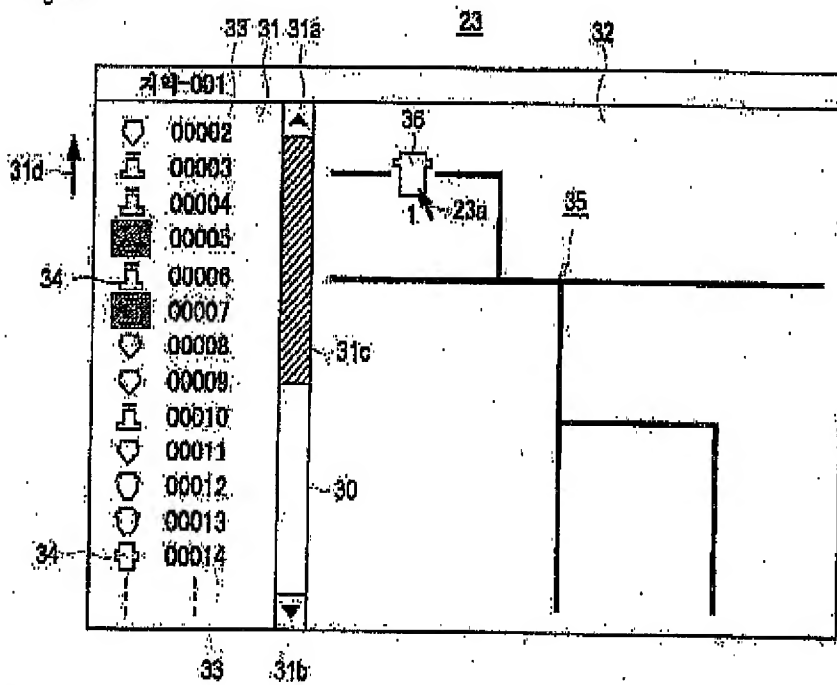
■ Fig. 23



■ Fig. 24

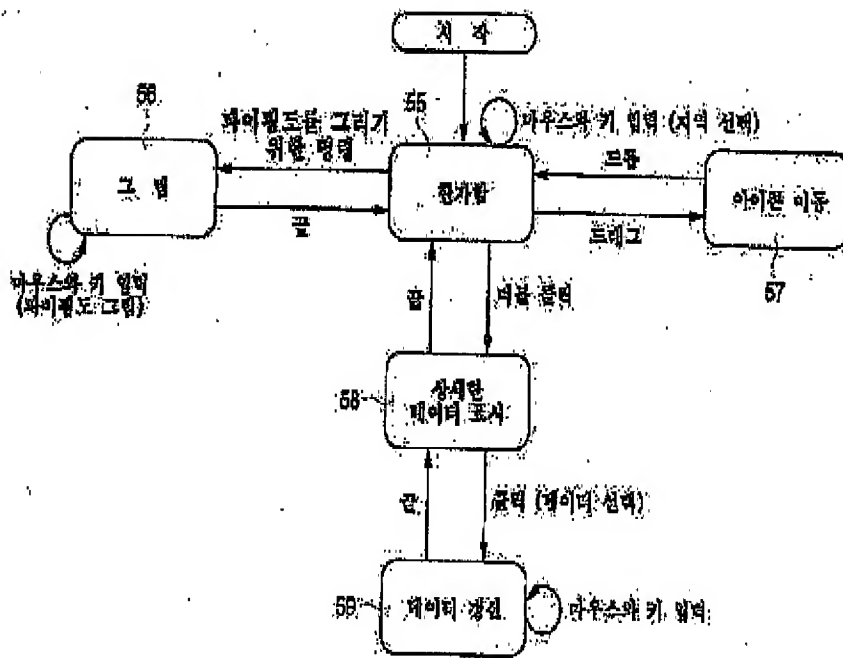


■ Fig. 25



■ Fig. 26





■ Fig. 27

81d	81b	81	82b	82d	82c	82	82g	83b	83d	83c	83	83g
<input checked="" type="checkbox"/> 저학 81f <input checked="" type="checkbox"/> 001 81a <input type="checkbox"/> 002 <input type="checkbox"/> 003 81g <input type="checkbox"/> 004 <input type="checkbox"/> 005 81e			<input checked="" type="checkbox"/> 이종리케이션 82f <input checked="" type="checkbox"/> 0-루타이어 <input checked="" type="checkbox"/> 웨이징 82b <input checked="" type="checkbox"/> 가일 <input checked="" type="checkbox"/> 프로세스 <input type="checkbox"/> 잠원 82e			<input checked="" type="checkbox"/> 압력 83f <input checked="" type="checkbox"/> 0-50 <input checked="" type="checkbox"/> 50-150 <input checked="" type="checkbox"/> 150-300 83a <input type="checkbox"/> 300-600 <input type="checkbox"/> > 600 83e			87 <input type="text" value="선택"/>			
<input checked="" type="checkbox"/> 자동 발주 84e <input checked="" type="checkbox"/> 0-12 84a <input type="checkbox"/> 12-24 <input type="checkbox"/> 24-36 84g <input type="checkbox"/> 36-48 <input type="checkbox"/> 48-60 84f			<input checked="" type="checkbox"/> 수선순위 85c <input checked="" type="checkbox"/> 매우 중요함 <input checked="" type="checkbox"/> 중요함 <input checked="" type="checkbox"/> 일반적임 <input type="checkbox"/> 보통 <input type="checkbox"/> 보라몬			<input type="checkbox"/> 트랩 타입 85e <input checked="" type="checkbox"/> 패킷 <input checked="" type="checkbox"/> 디스크 <input type="checkbox"/> 플로터 <input checked="" type="checkbox"/> 소프트웨어 <input type="checkbox"/> 자동차부속품			88 88 <input type="text" value="None"/>			
84 85d			85b 85a 85 85g 85f 86d 86b 86a 86 85g 86f			89 <input type="text" value="ALL"/>						

■ Fig. 28

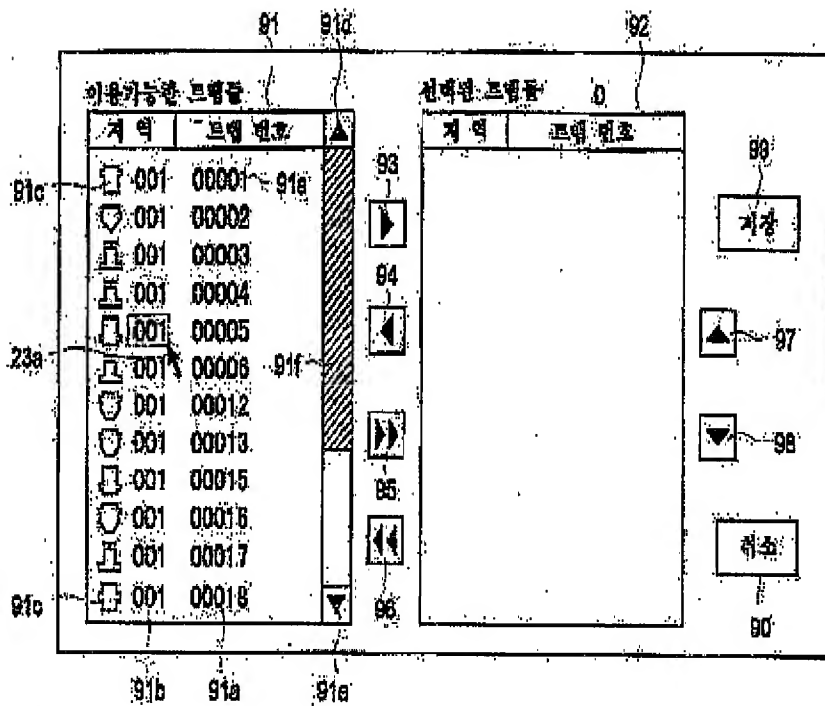


Fig. 29

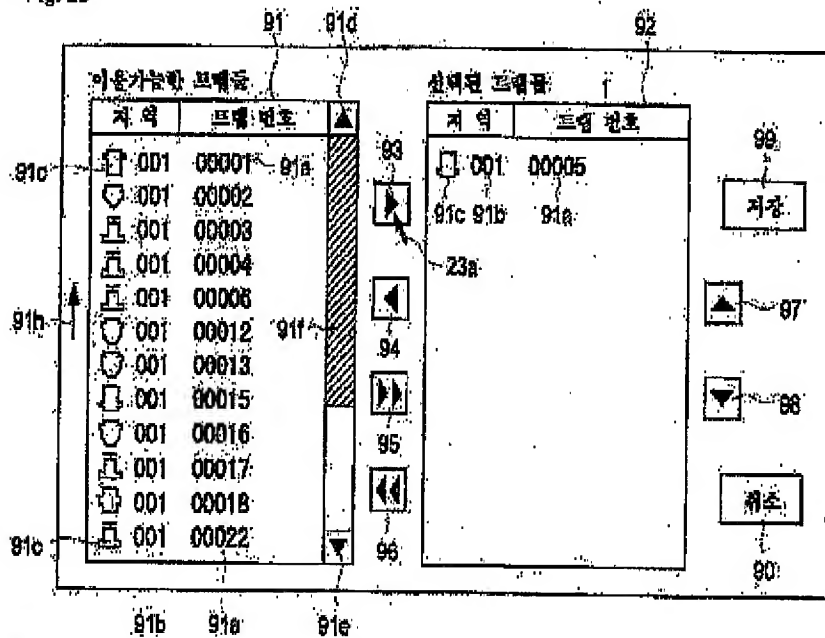
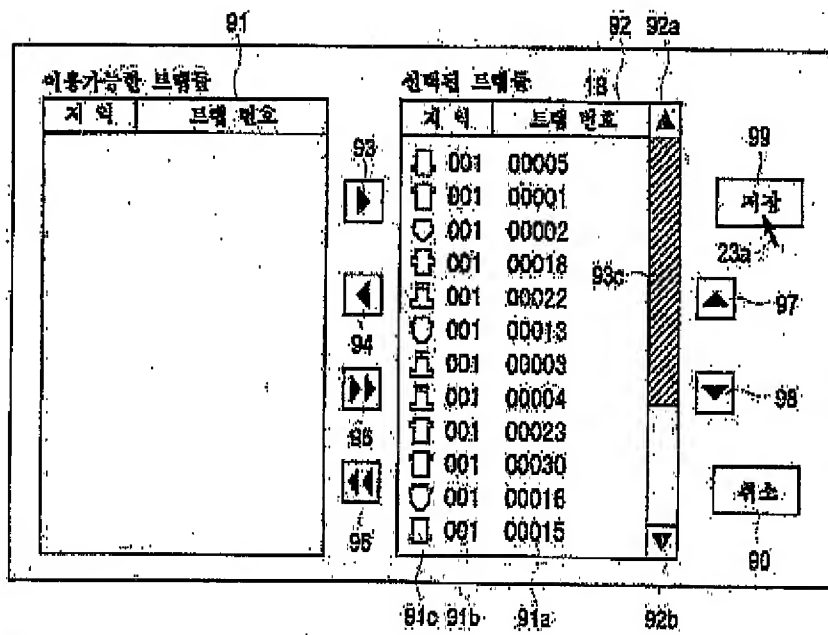
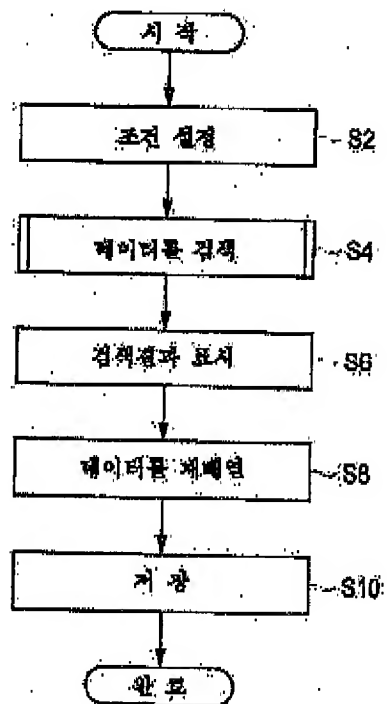


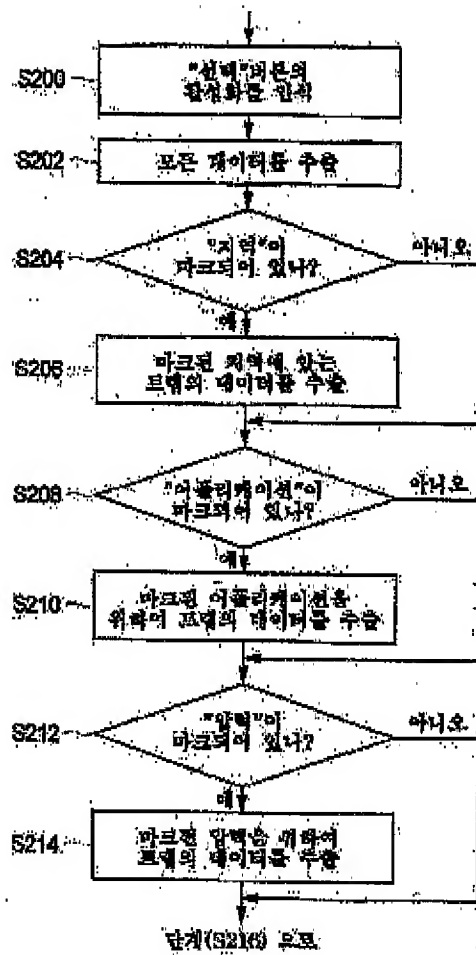
Fig. 30



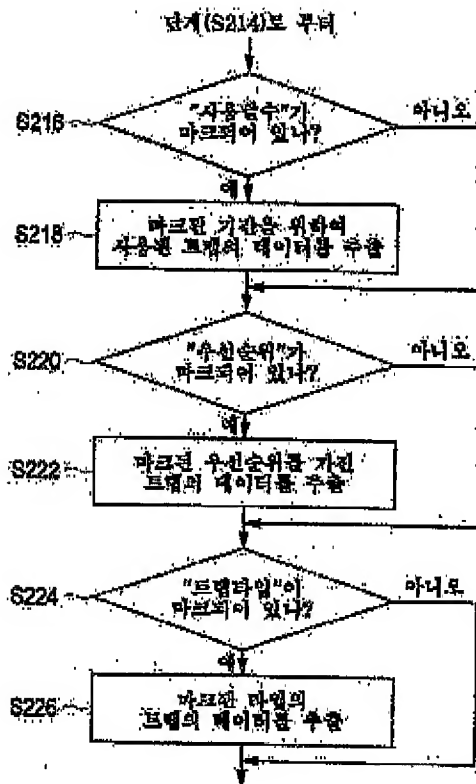
■ Fig. 31



■ Fig. 32a

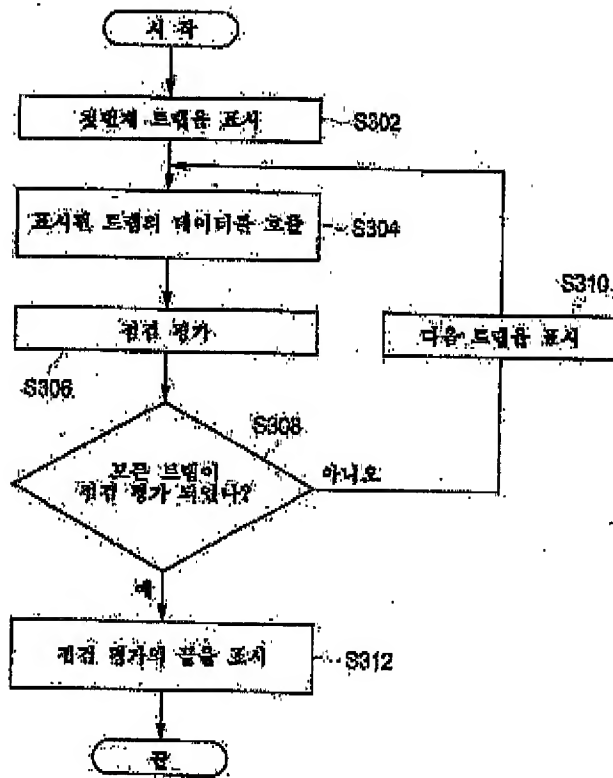


■ Fig. 32b



■ Fig. 33





## Legal Status

Date	Type of Document	Status
19980715	Patent Application	Received
19980715	Submission of Priority Certificate	Received
19980715	Request for Examination	Received
19981015	Amendment including Specification etc.	Amendment Approved
19981114	Submission of Priority Certificate	Received
20001030	Notice of Submission of Opinion	Delivery Completed
20001227	Request for Extension of Designated Period	Received
20010130	Request for Extension of Designated Period	Received
20010223	Written Opinion	Received
20010223	Amendment including Specification etc.	Amendment Approved
20010912	Notice of Submission of Opinion	Delivery Completed
20011110	Request for Extension of Designated Period	Received
20011212	Divisional Application of Patent	Received
20011212	Divisional Application of Patent	Received
20011212	Written Opinion	Received
20011212	Amendment including Specification etc.	Amendment Approved
20020528	Notice of Final Rejection	Delivery Completed
20040712	Written Decision on Registration	Delivery Completed

## Disclaimer

Machine-Translated document. KIPRIS

This English text above is machine translation provided by KIPRI for information only.

It cannot be used for legal purposes or distributed to the public without prior written consent of the KIPRI.

KIPRI does not warrant that this translation is accurate, complete, or free from defects, and nor is KIPRI responsible for any damage related to this translation.

Not-translated word will be marked with asterisks (\*).

(PDF Creation Date : 2009.06.18)